MARCH 31, 1945

Railway Age

Founded in 1856

THE LIBRARY OF CONGRESS SERIAL RECORD
APR 26 1945
COPY GIFT

"YOUNGSTOWN"

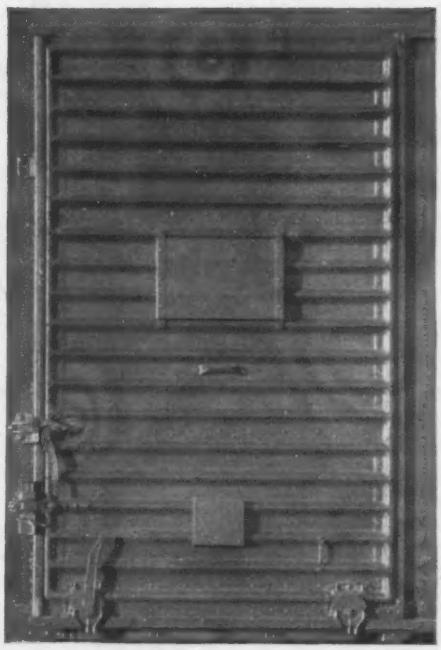
The standard freight car door

Steel Doors

Standard weight

Light weight

Special designs



Carbon steel

Yoloy

Aluminum

Camel Fixtures

More than ***One Million*** *Youngstown steel doors in service on U. S. and Canadian railroads*

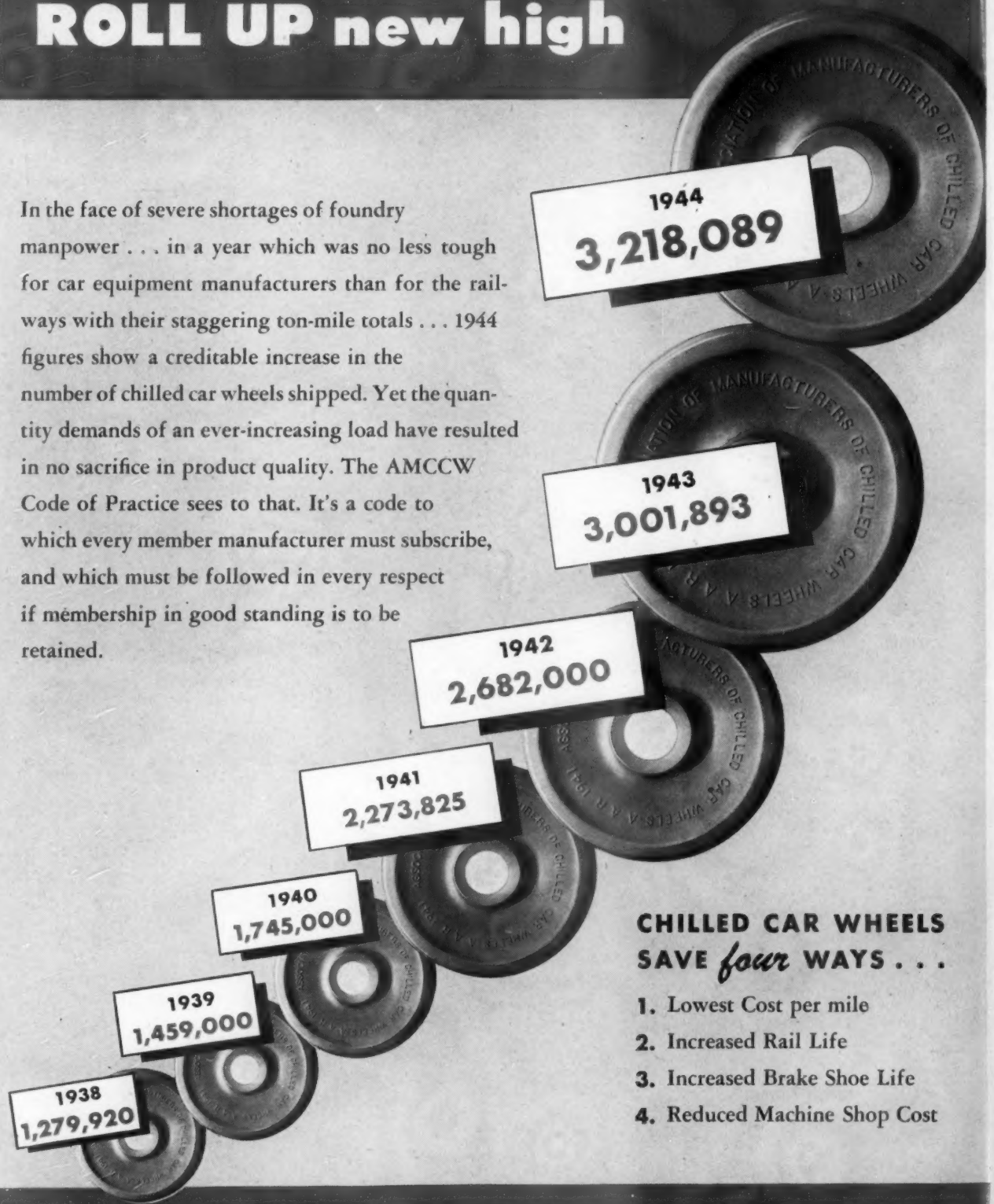
YOUNGSTOWN STEEL DOOR COMPANY

Camel Sales Company
Cleveland Chicago

Camel Company Limited
New York Youngstown

CHILLED CAR WHEELS ROLL UP new high

In the face of severe shortages of foundry manpower . . . in a year which was no less tough for car equipment manufacturers than for the railways with their staggering ton-mile totals . . . 1944 figures show a creditable increase in the number of chilled car wheels shipped. Yet the quantity demands of an ever-increasing load have resulted in no sacrifice in product quality. The AMCCW Code of Practice sees to that. It's a code to which every member manufacturer must subscribe, and which must be followed in every respect if membership in good standing is to be retained.



CHILLED CAR WHEELS SAVE *four* WAYS . . .

1. Lowest Cost per mile
2. Increased Rail Life
3. Increased Brake Shoe Life
4. Reduced Machine Shop Cost

AMCCW

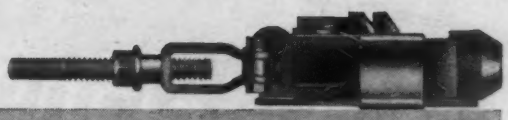
ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS

230 PARK AVENUE, NEW YORK, N. Y. • 445 NORTH SACRAMENTO BOULEVARD, CHICAGO, ILL.

Organized to achieve: Uniform specifications — Uniform inspection — Uniform product

Published weekly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the act of March 3, 1879. Subscription price $6.00 for one year U. S. and Canada. Single copies, 25 cents each. Vol. 118, No. 13.

SO FLAT



you hardly know it's there

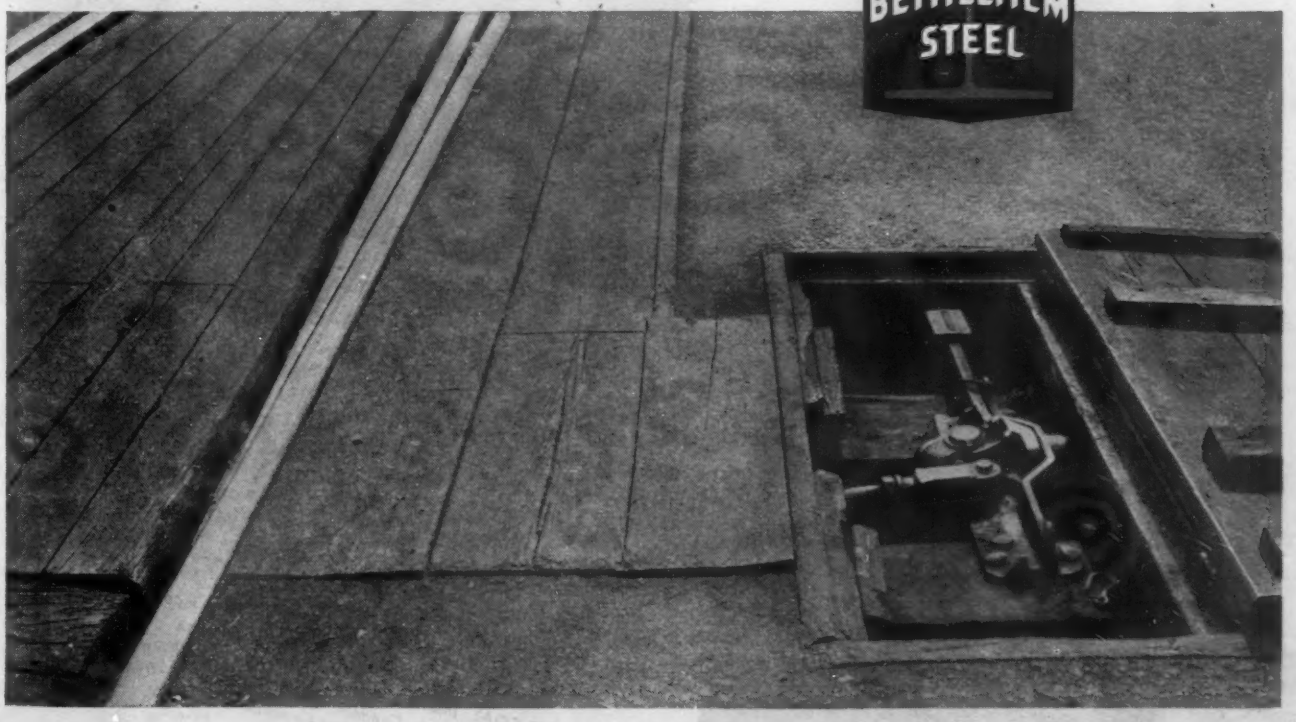
Bethlehem's No. 1222 Switch Stand has a great many structural advantages, but one of its most popular (so railroaders tell us) is the way it hugs the ground. It lies so flat you hardly know it's there.

Naturally, this low, compact construction makes it an ideal unit for confined locations, yard service, and station platforms. The absence of high, protruding parts is also an important safety factor, as the design presents little vertical area to be struck by passing equipment.

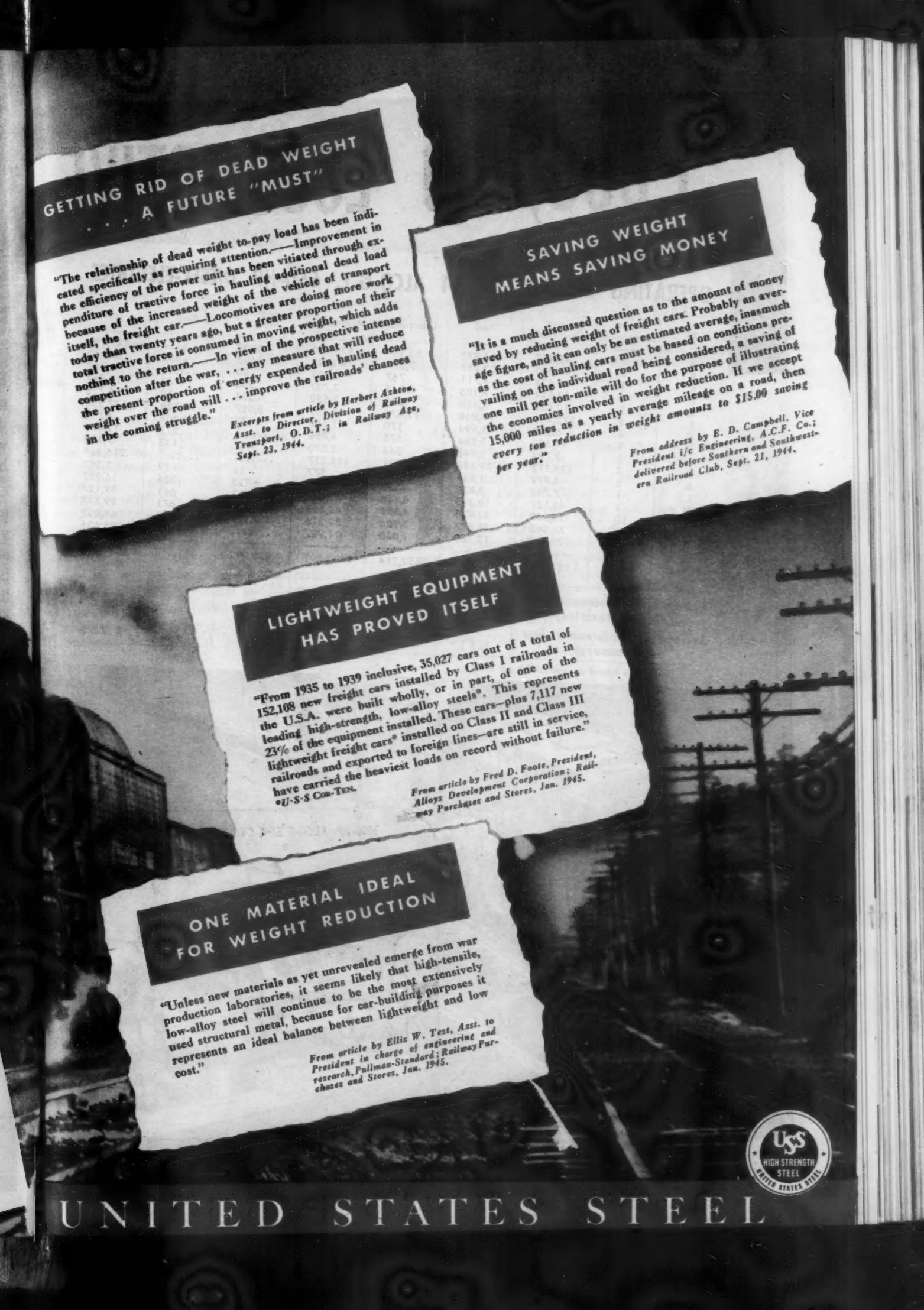
And speaking of safety: the 1222 is equipped with Bethlehem's well-known parallel throw, which means that the throwing lever operates in a line parallel to the rail. Thus, after throwing the switch, the operator is safely away from passing cars.

Model 1222 is a gearless type, operating on the sliding block and crank principle. In spite of its great leverage, it is an easy switch to throw. One reason for this is its extreme simplicity . . . there are no complicated mechanisms, no intricate linkages.

While designed chiefly for yard service, the 1222 has been used by some railroads in certain types of main-line work. Let a Bethlehem engineer show you what it can do with rail above the 60-pound class . . . how it can fit easily and economically into your system.



Thinking about lightweight in your future freight cars?
HEAR WHAT AUTHORITIES SAY...
U·S·S COR-TEN
IS AGAIN READY TO SERVE YOU
Now that Cor-Ten—the pioneer low-alloy, high-strength steel—is again available for freight car construction, your new equipment can be built lighter, stronger, longer-lasting and more efficient than ever before. Our engineers will gladly show you how lightweight construction with Cor-Ten can be applied to your designs, what it will cost, and the sound economic reasons that justify its use.
AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago, New York
CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago
COLUMBIA STEEL COMPANY, San Francisco
NATIONAL TUBE COMPANY, Pittsburgh
TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham
United States Steel Supply Company, Chicago, Warehouse Distributors
United States Steel Export Company, New York

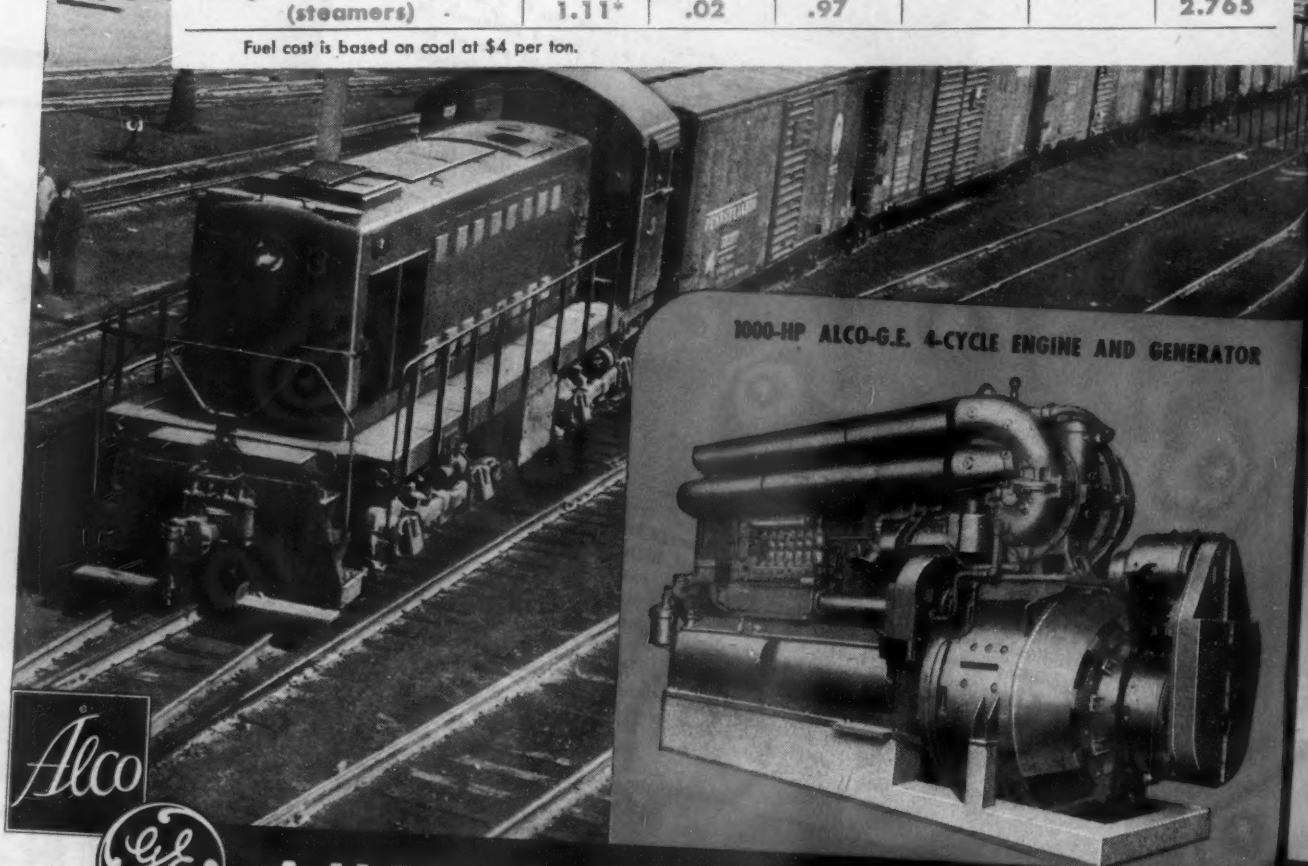

GETTING RID OF DEAD WEIGHT
. . . A FUTURE "MUST"
"The relationship of dead weight to pay load has been indicated specifically as requiring attention.——Improvement in the efficiency of the power unit has been vitiated through expenditure of tractive force in hauling additional dead load because of the increased weight of the vehicle of transport itself, the freight car.——Locomotives are doing more work today than twenty years ago, but a greater proportion of their total tractive force is consumed in moving weight, which adds nothing to the return.——In view of the prospective intense competition after the war, . . . any measure that will reduce the present proportion of energy expended in hauling dead weight over the road will . . . improve the railroads' chances in the coming struggle."
Excerpts from article by Herbert Ashton, Asst. to Director, Division of Railway Transport, O.D.T.; in Railway Age, Sept. 23, 1944.
SAVING WEIGHT
MEANS SAVING MONEY
"It is a much discussed question as to the amount of money saved by reducing weight of freight cars. Probably an average figure, and it can only be an estimated average, inasmuch as the cost of hauling cars must be based on conditions prevailing on the individual road being considered, a saving of one mill per ton-mile will do for the purpose of illustrating the economics involved in weight reduction. If we accept 15,000 miles as a yearly average mileage on a road, then every ton reduction in weight amounts to $15.00 saving per year."
From address by E. D. Campbell, Vice President i/c Engineering, A.C.F. Co.; delivered before Southern and Southwestern Railroad Club, Sept. 21, 1944.
LIGHTWEIGHT EQUIPMENT
HAS PROVED ITSELF
"From 1935 to 1939 inclusive, 35,027 cars out of a total of 152,108 new freight cars installed by Class I railroads in the U.S.A. were built wholly, or in part, of one of the leading high-strength, low-alloy steels*. This represents 23% of the equipment installed. These cars—plus 7,117 new lightweight freight cars* installed on Class II and Class III railroads and exported to foreign lines—are still in service, have carried the heaviest loads on record without failure."
*U·S·S Cor-Ten.
From article by Fred D. Foote, President, Alloys Development Corporation; Railway Purchases and Stores, Jan. 1945.
ONE MATERIAL IDEAL
FOR WEIGHT REDUCTION
"Unless new materials as yet unrevealed emerge from war production laboratories, it seems likely that high-tensile, low-alloy steel will continue to be the most extensively used structural metal, because for car-building purposes it represents an ideal balance between lightweight and low cost."
From article by Ellis W. Test, Asst. to President in charge of engineering and research, Pullman-Standard; Railway Purchases and Stores, Jan. 1945.
USS
HIGH STRENGTH
STEEL
UNITED STATES STEEL

1,000,000 LOCOMOTIVE-

OPERATING RECORDS OF 54 ALCO-G.E. 660-HP DIESEL-ELECTRICS

RR	No. of Locomotives	Hours Operated	Fuel	Lubrication	Maintenance	Engine House	Misc.	Total
A	3	49,477	$14,922	$2,549	$23,483	$220	$754	$41,928
B	3	103,506	33,251	7,577	40,893	4,606	636	86,963
C	1	15,634	4,711	767	2,929	80	.....	8,487
D	4	32,884	8,405	964	3,702	556	40	13,667
E	2	10,622	3,562	201	1,552	324	89	5,728
F	8	272,409	70,968	12,675	83,782	5,087	4,738	177,250
G	4	6,940	1,594	170	1,165	173	1,408	4,510
H	1	17,500	5,864	576	5,758	.....	277	12,475
I	1	9,794	3,948	544	2,070	487	133	7,182
J	8	229,272	79,569	10,681	126,217	.....	.....	216,467
K	2	4,719	1,531	154	577	12	19	2,293
L	1	7,798	3,873	383	7,672	4,733	306	16,967
M	1	46,127	18,345	6,148	43,660	333	641	69,127
N	10	128,259	33,723	4,331	45,698	5,254	671	89,677
O	4	88,363	28,277	3,934	32,216	2,127	1,473	68,027
P	1	28,503	13,160	1,060	11,927	.....	478	26,625
TOTAL	54	1,051,807	$325,703	$52,714	$433,301	$23,992	$11,663	$847,373
Average cost per locomotive-hour (diesel-electrics)			$0.309	$.05	$.412			$0.806
Average cost per locomotive-hour (steamers)			1.11*	.02	.97			2.765

Fuel cost is based on coal at $4 per ton.



1000-HP ALCO-G.E. 4-CYCLE ENGINE AND GENERATOR

Alco GE

AMERICAN LOCOMOTIVE

HOURS ON 16 RAILROADS...

prove fuel and maintenance costs of Alco-G.E. units are 65% less than those of steamers

THE operating records of 16 railroads (covering 54 Alco-G.E. 660-hp units over periods as long as eight years) reveal fuel costs that average less than one-third, and maintenance costs that average less than one-half, those of five-year-old steamers doing similar work. The total of all locomotive operating expenses, less wages, of these 54 diesel-electrics averages only 30 per cent of the same costs of steamers.

One reason why savings are so high with Alco-G.E. diesel-electrics is that each component is specially designed for operating economy. For example, the 4-cycle engine has these advantages:

1. LOW FUEL CONSUMPTION. Cylinder pressures and temperatures are inherently low, reducing the possibility of blow-by and incomplete or premature combustion, all of which waste fuel.

2. LESS MAINTENANCE. A reversal of load, which allows both sides of the piston pin to be thoroughly lubricated, lengthens the periods between recommended inspections to two years, or 16,000 hours of operation.

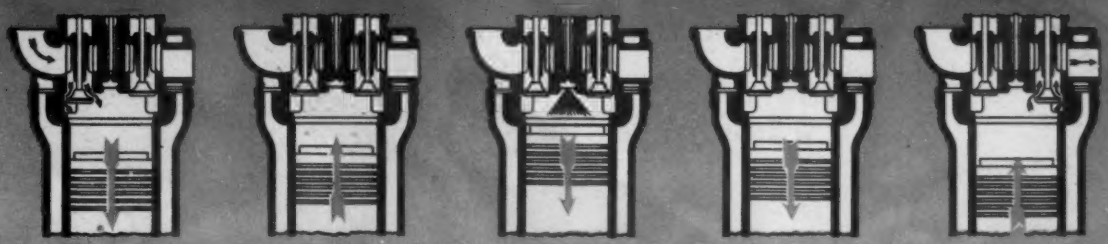
3. LONG ENGINE LIFE. There is no overheating and weakening of engine parts nor rapid oxidation of lubricants—the three strokes between combustion strokes allow ample time for cooling.

4. LESS LUBE OIL USED. The cylinder liners, which receive the brunt of engine wear, are smooth, perfectly symmetrical and portless; this prevents ring sticking, sludge deposits, and varnishing which increase lubricating oil consumption.

In addition to providing operating economies, these advantages of Alco-G.E. diesel-electrics also account for their higher-than-average availability and "use-ability." On one eastern road, where eight units are averaging 98.7 per cent availability, the utilization factor is 87.3 per cent, and the locomotives still have extra locomotive-hours available for emergency work.

These results are typical. What Alco-G.E. diesel-electrics can do for you can best be determined by a motive-power survey for which we offer the services of our engineers. Our recommendations will be impartial. We build all three types of motive power—diesel-electric, electric, and steam.

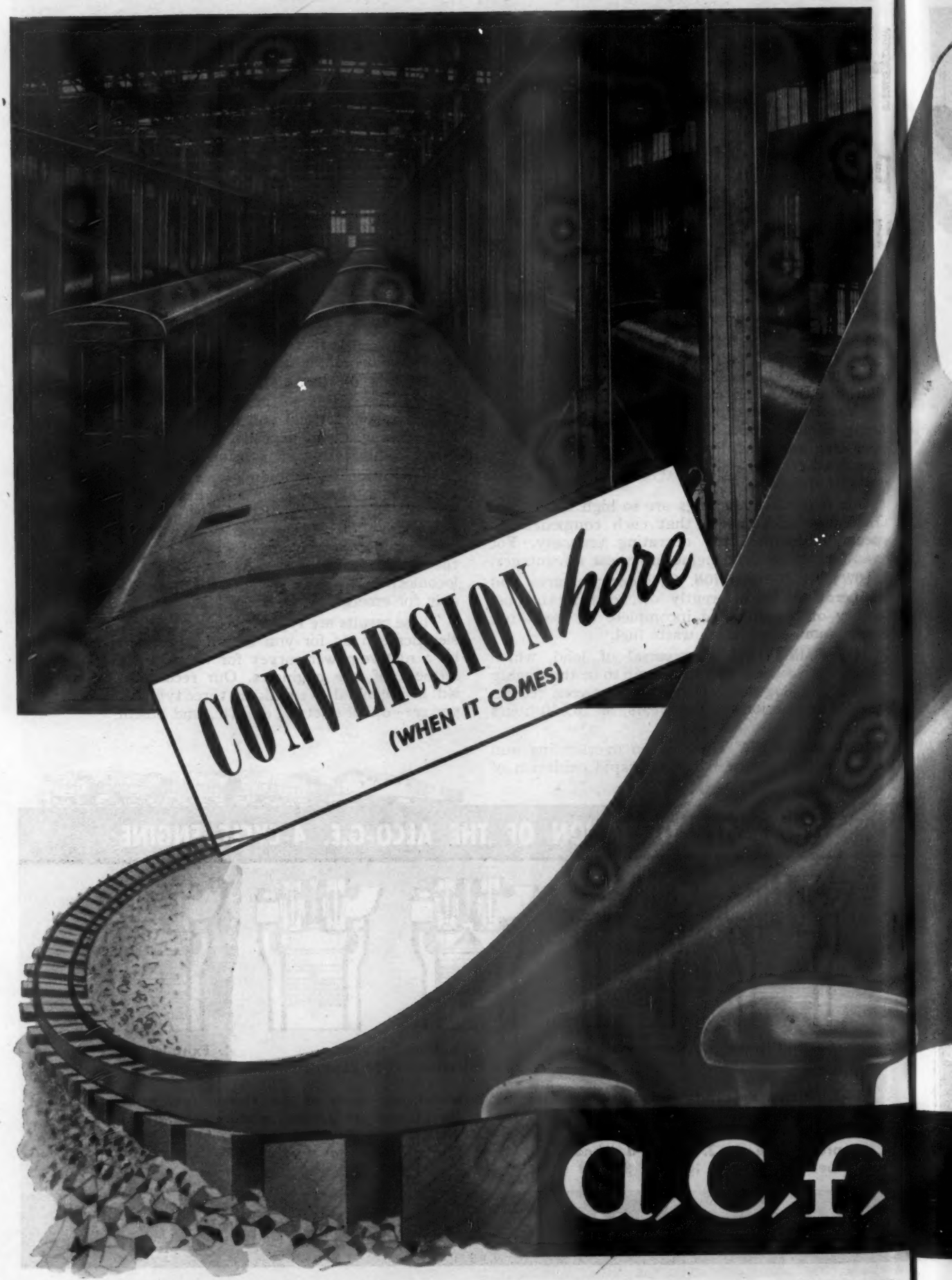
STEP-BY-STEP OPERATION OF THE ALCO-G.E. 4-CYCLE ENGINE



1. Suction stroke 2. Compression stroke 3. Working stroke a. Fuel injection b. Expansion 4. Exhaust stroke

1. Piston descends and draws air into the cylinder through the inlet valve. 2. Piston ascends with all valves closed and compresses the air. 3. Piston descends. First (a), fuel enters and ignites. Second (b), after about one-tenth of the stroke, fuel valve closes, and the burning mixture expands. 4. Piston ascends and expels burnt gases through the exhaust valve.

and GENERAL ELECTRIC


CONVERSION here
(WHEN IT COMES)
a.c.f.

Means just the time it takes to

Clear the Tracks

Busy in its other plants building the ordnance of war . . . at St. Charles, A.C.F. is constructing passenger rolling stock for the Army *right now.* Railroads seeking streamlined and other passenger rolling stock—and wanting it FAST—can measure our change-over time in *hours!*

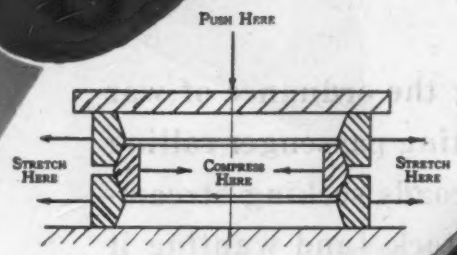
Coupled with available facilities, A.C.F. offers the railroads *five* definite and distinct advantages: (1) Extensive knowledge of passenger and traffic requirements (2) an open mind and a skillful hand to work in the metal best suited for the *individual* requirement (3) 2,000,000 passenger and freight cars of experience gained in the present century alone (4) streamlined trains that have proved themselves (5) new designs that reflect the best of the past —and the finest promise for the future!

Whatever A.C.F. Builds—It Is Known to Build Well!

AMERICAN CAR AND FOUNDRY COMPANY

NEW YORK · CHICAGO · ST. LOUIS · CLEVELAND · WASHINGTON · PHILADELPHIA · PITTSBURGH · ST. PAUL · SAN FRANCISCO

Edgew



PRINCIPLE OF THE RING SPRING

CHICAGO MILWAUKEE ST. PAUL AND PACIFIC

EDGEWATER STEEL COMPANY · PITTSBURGH, PA.

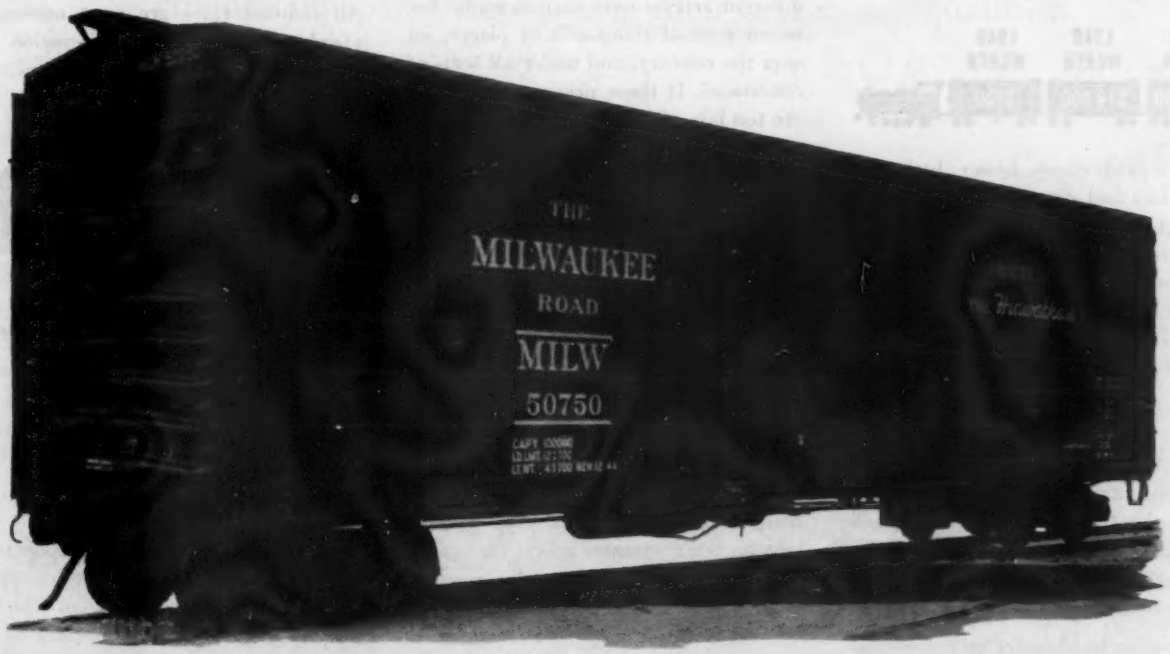
...ater DRAFT GEARS

SIMPLICITY

through EDGEWATER'S exclusive RING SPRING PRINCIPLE

THE Edgewater B-32-KA Draft Gear is "packaged protection". The husky ring spring, lubricated for life, is enclosed in a sturdy pressed steel housing. The complete gear, with automatic length restriction device for ease of installation, is ready to slip into the pocket of your cars.

The exclusive ring spring principle also insures long life, high capacity, smooth action, and positive release. These qualities of Edgewater Draft Gears are fully demonstrated by A.A.R. sponsored tests.



Modern 50-ton box car built in December 1944 by the Milwaukee Road in its own shops.

Atlanta, Ga. Baltimore, Md. Boston, Mass. Chicago, Ill. Cleveland, O. Kansas City, Mo. Louisville, Ky. New York, N.Y.
Philadelphia, Penna. St. Louis, Mo. St. Paul, Minn. San Francisco, Calif. Seattle, Wash. Washington, D. C.

"What does it cost *to ship a Ton a Mile?*"

FOR moving one ton one mile by rail, the average charge—and note that word "average"—is less than one cent.

O.K., you may say, that ought to make freight rates simple. Why not "sell a ticket" for moving freight, just like selling a passenger ticket? Take the number of tons, the number of miles, the average charge, and figure it out?

We wish it could be that easy. But here is the problem.

Some freight is cheap, heavy, little subject to loss and damage. Some is valuable, light and bulky, difficult, risky and expensive to handle. Such differences in the character of freight call for differences in rate making. No one would suppose that charges should be the same on a ton of coal as on a ton of diamonds.

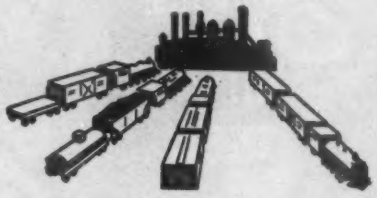
To charge even as little as one cent per mile for hauling a ton of some of the heavy, low-priced commodities would mean, in many cases, making rates so much higher than they are now that such commodities could not move over the long distances we have in this country and be sold at a profit in distant markets.

On the other hand, rates on more valuable articles can be much higher than the average without making any appreciable difference in the price at which they are sold.

So, to make it possible for all sorts of freight to be moved to market, and at the same time meet the necessary costs to the railroad of doing the job, there came to be these differences in freight rates—with the result that shippers, railroads and the public benefit from the amazingly wide distribution and use of all sorts of commodities all over America.

"Prices" tailored to the public interest

Rate-making seems complex. But that's because commerce is complex. Rates, or transportation prices, must be made for the movement of tens of thousands of different articles over various routes between tens of thousands of places, all over the country, and under all sorts of conditions. If those prices, as a whole, are too low, the railroads won't be able to meet the costs of doing business. But if transportation is priced too high, the traffic doesn't move—and that is not good for either railroads or shippers.



And so it is that over the years the railroads have worked on a basis of "what is best for our customers is best for us." It is to the interest of every railroad to build up the area it serves. It wants to encourage the growth of industries. It wants to encourage agriculture. It wants to encourage mining, lumbering, every other type of business. Rates are figured out for just that purpose—to meet the needs of commerce—and are revised to respond to changes in those needs as they come about.

Where the I. C. C. comes in

Many years ago, the Interstate Commerce Commission was established to prevent undue discrimination in railroad rates as between shippers and communities, and to see that rates are "just and reasonable."

All railroad rates are open covenants openly arrived at after discussion between the railroads and shippers. All

rates are published, are filed with the I.C.C., and are open to anyone to see.

But in any case, a shipper who isn't satisfied has the right to ask that the I.C.C. step in and investigate. And more than 250 volumes of I.C.C. reports show how active the Commission has been in this respect.

This principle of tailoring transportation prices to the public interest has stood the test of time—and no man who has made a sincere and expert study of the problem has found a better system for all concerned.

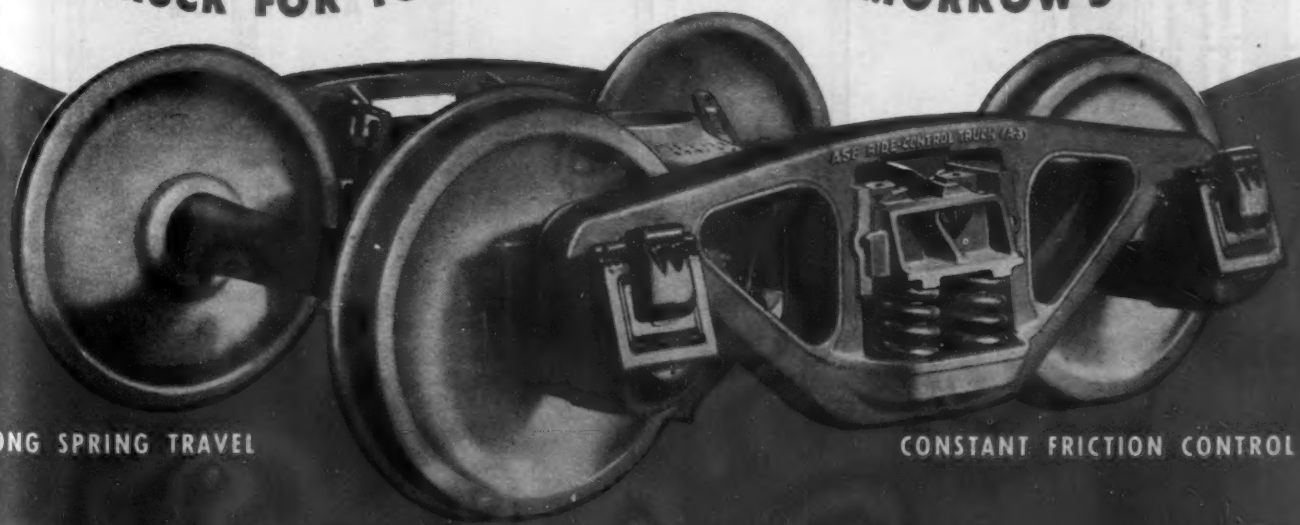
ASSOCIATION OF
AMERICAN RAILROADS
ALL UNITED FOR VICTORY

Ride-Control

GETS ALL THE "GIVE" FROM COIL SPRINGS!

Coil springs give a smooth, easy ride when used with the A.S.F. Ride-Control Truck (A-3). They develop their best riding qualities because the unique principle of constant friction that controls them does not perceptibly interfere with their softness when absorbing impact—does not materially affect their cushioning qualities. It *does* enable coil springs to develop their best riding qualities.

THE TRUCK FOR TODAY'S NEED . . . TOMORROW'S SPEED!



ONG SPRING TRAVEL

CONSTANT FRICTION CONTROL

AMERICAN STEEL FOUNDRIES

CHICAGO

MIDT-MARK OF TIME CASE STEEL

Let's Look at the Record of

ITEM

ALUMINUM ORE COMPANY HOPPER CARS

Ten aluminum hopper cars built for Aluminum Ore Company, East St. Louis, Ill., have completed 12 years of successful service.

They have covered three times the mileage of the average hopper car—the equivalent of 35 years of service. And they are good for at least 24 years more service.

Here is their remarkable performance record:
Total Mileage—3,537,647 miles
Average Mileage per Car—353,764
Daily Average Mileage per Car—80.77
Savings in Maintenance—$.00568 per car mile.*

ALUMINUM COMPANY OF AMERICA, 2178 Gulf Building, Pittsburgh 19, Pennsylvania.

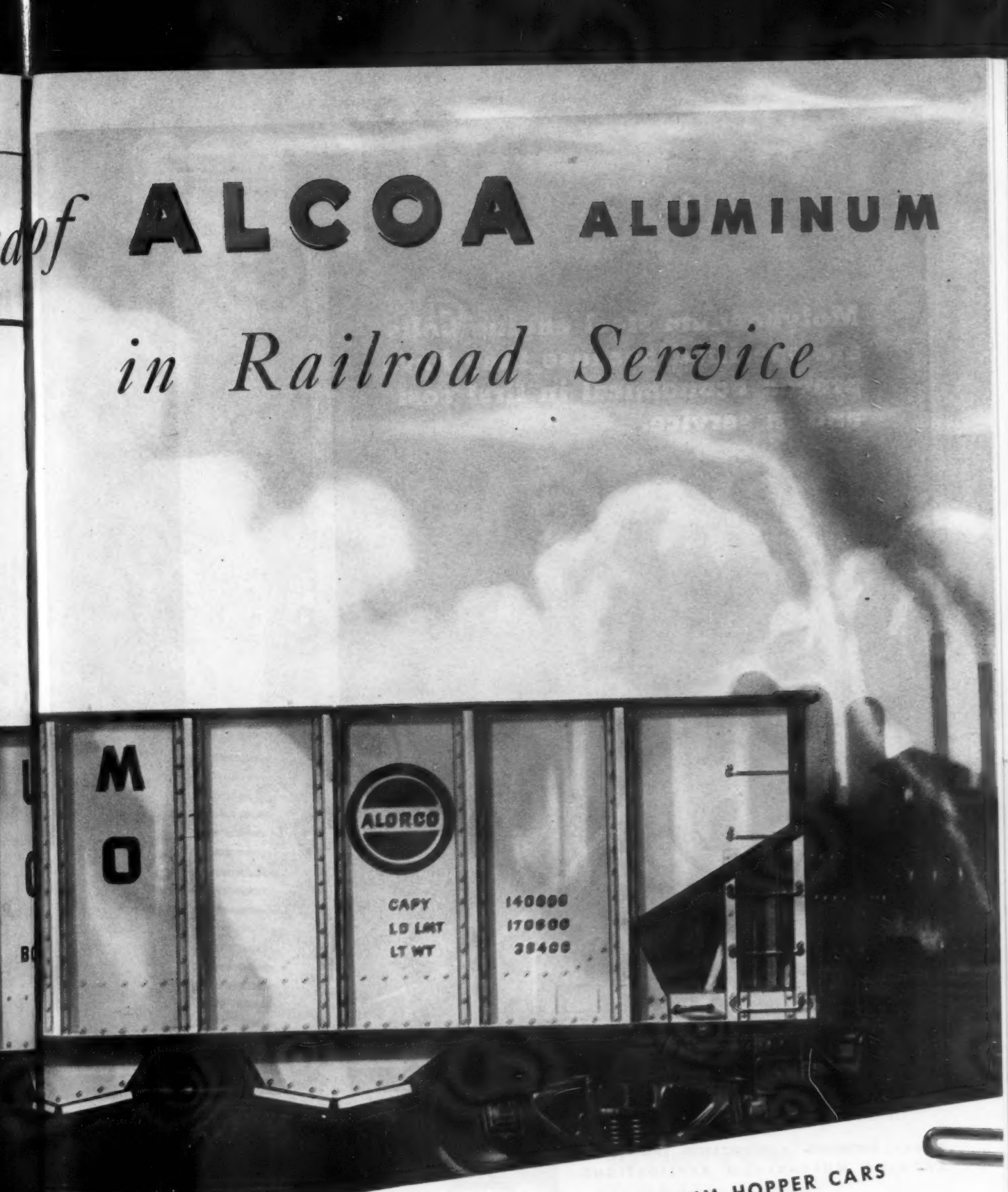
**Comparison is with steel cars of the same design in the same service.*

ALCOA FIRST IN **ALUMINUM**

ALCOA
ALUMINUM

...of ALCOA ALUMINUM

in Railroad Service



MECHANICAL DATA ON ALUMINUM HOPPER CARS

With exception of the center sills, car bodies were identical with the steel hopper cars then being built by Canton Car Company.

Center sills were made of Alcoa standard rolled channel 17 S-T alloy with top and bottom cover plates of the same alloy. They were designed to conform with AAR specifications.

The aluminum center sills have given no trouble, are in good condition after withstanding heavy impact loads in buffing and pulling.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

ARMY E NAVY

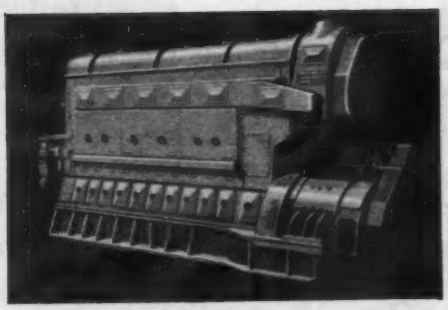
MOLYBDIC OXIDE, BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company

500 Fifth Avenue · New York City

MOLY

TOMORROW'S POWER TODAY!

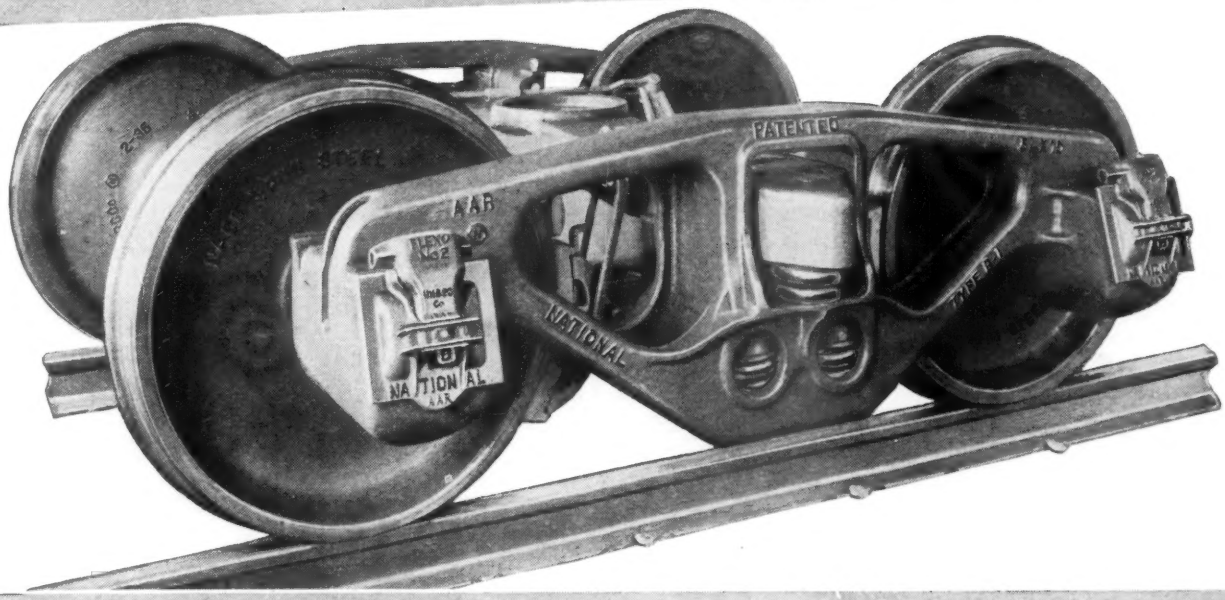


It's the Opposed-Piston Diesel Locomotive by

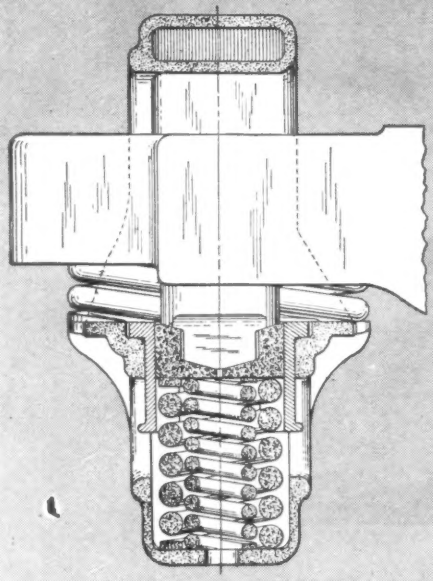
FAIRBANKS-MORSE

A NAME WORTH REMEMBERING

It's here Now!!



The Truck for post-war fast freight service



Section thru Control Unit.
Two Control Units in each frame.

Full protection of cars and lading, rails and roadbed, is essential for economical railroad operation.

A smooth riding car relieves the car and contents from damaging vibrations and shocks, reduces wear on track and car structure, and greatly lengthens the life of equipment.

The National B-1 Truck is equipped with four built-in friction units which control both vertical and horizontal oscillations. No separate snubbers are necessary.

The frictional snubbing action is governed by the load carried, thus assuring a smoother riding car whether light or loaded.

Specify National B-1 Trucks with Dual Control

76 Years Service to Transportation

NATIONAL MALLEABLE AND STEEL CASTINGS CO.

General Offices: CLEVELAND. OHIO

Sales Offices: New York, Philadelphia, Chicago, St. Louis, San Francisco.
Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.

Canadian Representatives, Railway & Power Engineering Corporation, Ltd., Toronto and Montreal

a

FIR

built o

Before the W
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THE

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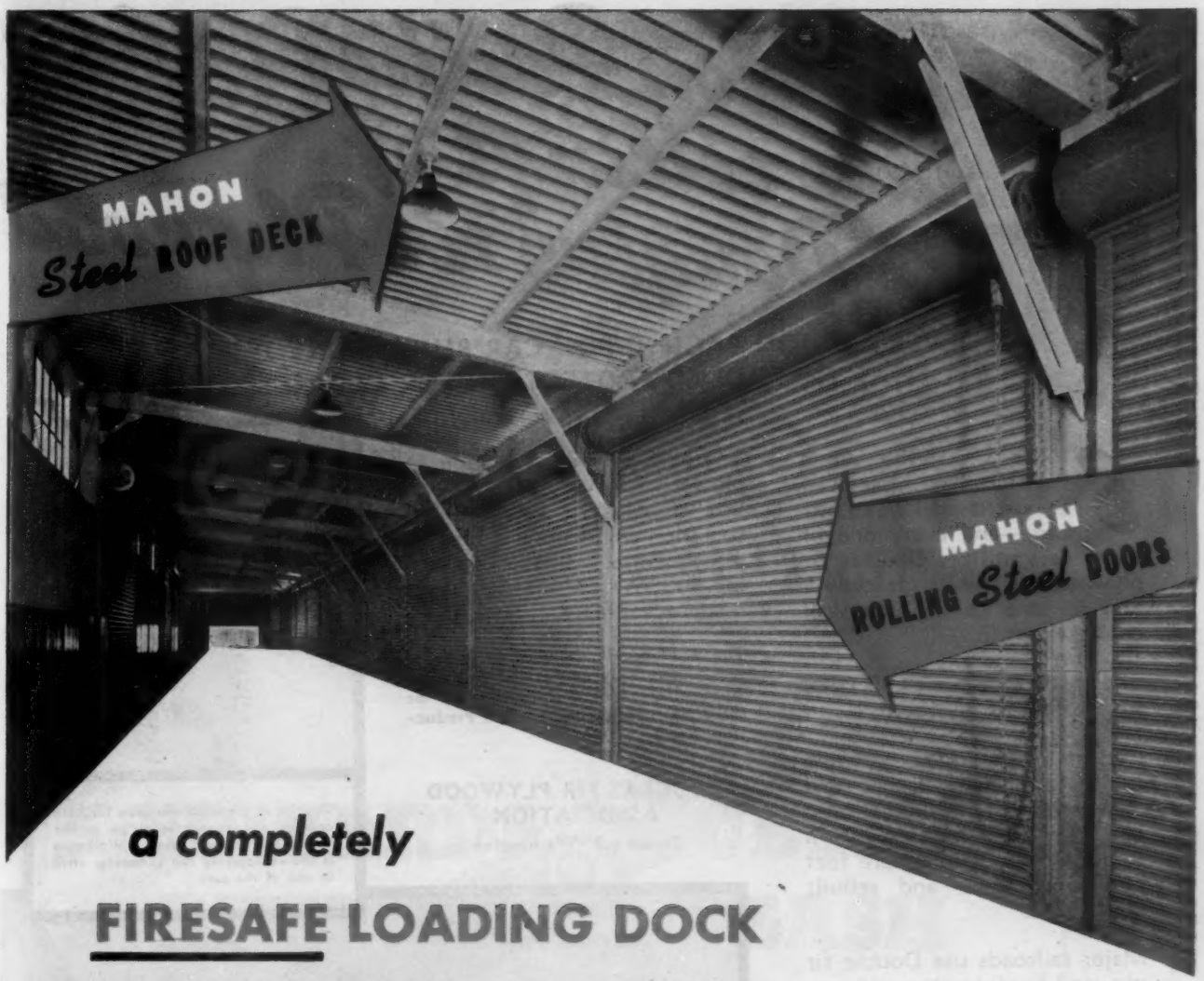
TINGS CO.

Montreal



a completely

FIRESAFE LOADING DOCK

built of MAHON Doors and Deck

Before the Wabash Railway erected this loading dock in Chicago, a thorough investigation was made to determine the most practical construction. As a result, not only were Mahon Rolling Steel Doors selected for all door openings, but to insure the utmost in security, firesafety and permanence, *throughout*, the building was roofed with Mahon Steel Deck. Thus, practically the entire structure represents a Mahon installation. A completely interlocked *welded* unit, it is unusually strong and substantial. Quickly and easily erected, it is built for lifetime service. It is surprisingly low in cost. Large, full-aperture door openings greatly facilitate the moving in and out of freight. In planning future projects of this nature—and for warehouses, depots and many other types of buildings—you will find it well worth while to investigate the many exclusive advanatges of Mahon Rolling Steel Doors and Mahon Steel Deck. Our engineers will supply you with detailed facts and figures.

THE R. C. MAHON COMPANY

DETROIT 11 — CHICAGO 4

Manufacturers of Rolling Steel Doors and Shutters • Also Steel Deck for Roofs, Siding, Partition Walls and Doors, Acoustical Ceilings and Permanent Floor Forms • Roof Sumps and Roof Sump Receivers

10,114 Union Pacific Box Cars have ceilings of Douglas Fir Plywood

EVERY UNION PACIFIC BOX CAR BUILT SINCE 1936 HAS THIS ADDED PROTECTION FOR LADINGS

SINCE 1936, the Union Pacific railroad has built or purchased 10,114 box cars—and every one of these cars utilizes Douglas fir plywood for the inside ceiling and for the ceiling-side wall connector strip.

That's a total of 4,450,000 square feet of plywood!

Pacific Fruit Express (owned jointly by Union Pacific and Southern Pacific) has also used plywood extensively—a total of 4,119,146 square feet in 11,188 new and rebuilt reefer cars.

Major railroads use Double fir plywood because it speeds car construction and produces a car that is strong, rigid, dust-proof, tight—able to stand the toughest service.

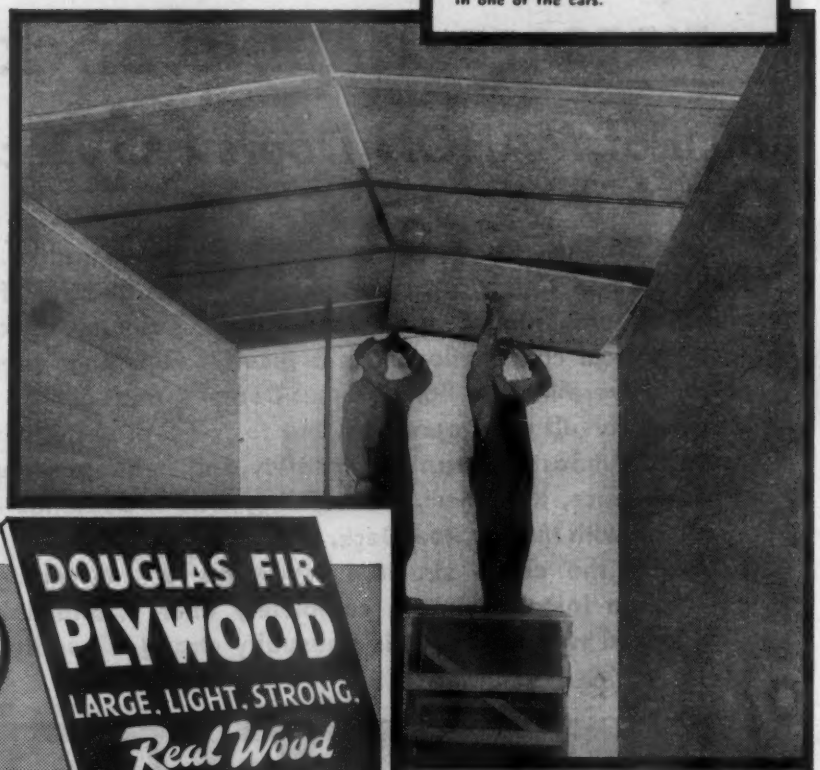
Douglas fir plywood has many other uses in the railroad field, too—as a versatile structural material for building and modernizing stations, for freight sheds and warehouses, concrete forms, and for other maintenance and construction uses.

There is a type and grade of plywood for every construction use. Douglas Fir Plywood Association engineers will be glad to cooperate with you in making full use of this material's many advantages.

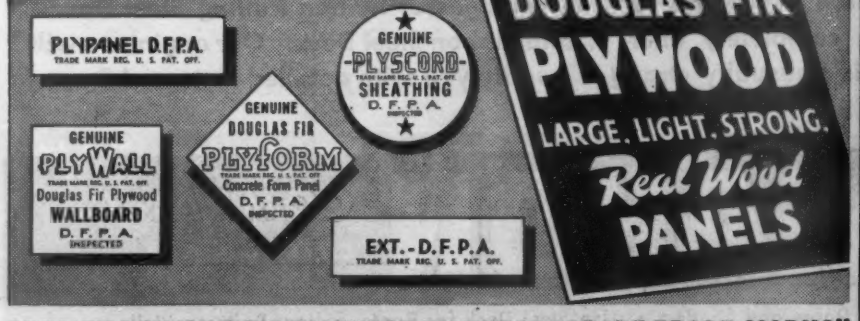
Today, of course, Douglas fir plywood is available only on highest priorities. Application for allocation must be made by suppliers to the War Production Board.

DOUGLAS FIR PLYWOOD ASSOCIATION
Tacoma 2, Washington

Douglas fir plywood was used for both ceilings and connector strips in the Union Pacific cars. Above, Workman is shown applying the connector strip in one of the cars.



The large, light, sturdy plywood panels are easily and quickly applied. The finished job, too, possesses many outstanding advantages.



SPECIFY DOUGLAS FIR PLYWOOD BY THESE "GRADE TRADE-MARKS"

For

NO FOG • NO FILM • NO FROST

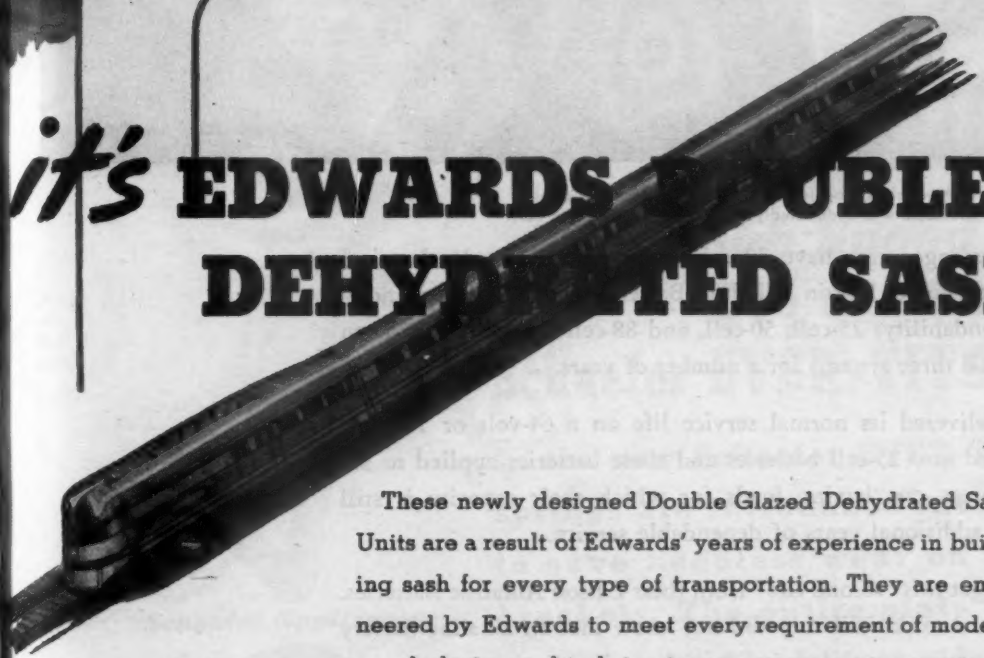
•• MODERN STREAMLINED DESIGN

•• LIGHTER WEIGHT *with* GREATER STRENGTH

•• EASIER QUICKER INSTALLATION

TOP AIR CONDITIONING EFFICIENCY

INCREASED PASSENGER SATISFACTION



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These newly designed Double Glazed Dehydrated Sash Units are a result of Edwards' years of experience in building sash for every type of transportation. They are engineered by Edwards to meet every requirement of modern coach design and to bring to your passengers new standards of travel comfort and convenience.

O. M. EDWARDS CO., INC. • SYRACUSE, N.Y.

EDWARDS SASH

THE EYES OF TRANSPORTATION

SASH FOR EVERY TYPE OF TRANSPORTATION—ON LAND, ON THE SEAS, IN THE AIR

32 VOLTS, 64 VOLTS, or 110 VOLTS?

The modern lightweight streamlined car makes extensive use of electric power; the same will undoubtedly be true of the post-war car.

Will the post-war passenger cars have 32-volt, 64-volt, or 110-volt electrical systems? Whatever the choice, Edison Alkaline Batteries will provide standby power of highest dependability; 25-cell, 50-cell, and 88-cell batteries have been in successful use with all three systems for a number of years.

After a battery has delivered its normal service life on a 64-volt or 110-volt car, it can be regrouped into 25-cell batteries and these batteries applied to 32-volt baggage and express cars having loads for which their capacity is still adequate, thus giving additional years of dependable service.

A number of railroads get this "second life" from their Edison Alkaline Batteries. They could hardly afford to do it if they did not know that an alkaline battery remains a dependable power even after its normal service life has been completed. It's a feature of alkaline batteries that designers of post-war cars are invited to look into. *Edison Storage Battery Division of Thomas A. Edison, Inc., West Orange, New Jersey.*

An alkaline battery in the battery compartment saves weight where it counts the most. It is suspended near the middle of the car where every pound saved may be as effective in reducing structural stresses as five pounds saved elsewhere. The larger the kilowatt-hour capacity, the greater is the weight that can be saved by the use of an alkaline battery.

Edison

THE LIGHTWEIGHT BATTERY

FOR LIGHTWEIGHT CARS

Schaefer Appliances

STANDARD ON MOST ROADS

For High Speed Service Use the New

Schaefer EVER-TITE Wear Plate

In the new Schaefer EVER-TITE wear plate, springs are introduced into the wear plate to save needless wear on the side frame brackets. The entire plate assembly is designed to fit firmly into side frame bracket, eliminating play and resultant wear. Especially recommended for high speed freight service.

LIGHT WEIGHT DESIGN INSURES MORE THAN CAR LIFE

Schaefer **EQUIPMENT COMPANY**

KOPPERS BUILDING • PITTSBURGH, PA.

DROP-FORGED FOR LIGHT WEIGHT, HIGH STRENGTH, LONG LIFE AND SAFETY

At no matter what angle the foot approaches, Morton "Open-Grip" Safety Tread affords positive protection against slipping. Its sharp-edged, perforated and raised buttons get a sure grip on any sole material—and hold fast.

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Circular openings of "Open-Grip" have self-clearing, curved surfaces that shed water completely. They offer no hold for snow or ice to interfere with anti-slip functions.

Flanges extending downward from openings make "Open-Grip" rigid and far stronger than sheet from which it is made.

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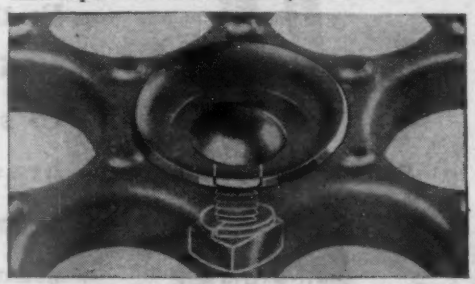
Write today for complete information on this highly effective, low cost anti-slip surface for running boards, brake steps and platforms. Reasonably prompt deliveries are being made now.

Cut-away view showing added strength that results from deep drawn flanges around drainage openings. Anti-slip buttons increase safety of tread.



Easy, quick installation is achieved through this special device which fits any of the open areas of the tread. Rotating, elongated bolt slot compensates for ordinary variations in saddle punching.

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Station platforms are only one of dozens of places where pressure-treated wood is saving labor, time, money and trouble for users. Our bulletin, "Economical and Permanent Construction with Pressure-Treated Wood" illustrates and describes a number of applications, and also gives information about wood use, treating methods, and so on. Ask for a copy for your file.

KOPPERS COMPANY, INC. • WOOD PRESERVING DIVISION

PITTSBURGH 19, PA.

Buy More War Bonds— and Keep Them!

KOPPERS

THE INDUSTRY THAT SERVES ALL INDUSTRY

☆ *ARMY HANGAR utilizes roof trusses of crescent design prefabricated by Timber Structures, Inc. Use of crescent type instead of flat bottom chords permitted lowering hangar sidewalls 12' yet furnished sufficient height where needed. Trusses were shipped to jobsite in five sections, assembled and erected as single units.*

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...BUILD WITH TIMBER STRUCTURES

Thinking about a new industrial or commercial building is one thing. Planning the structure is another thing. Selection of materials and construction is something else again. Through every step from blueprint to completion you work with specialists, from whom you demand service.

At Timber Structures we know the importance of service in the prefabrication of timber trusses. Skilled engineering, efficient manufacture, fast shipping and erection are demonstrated in these examples:

1. Highway bridges completed and shipped 18 days after order received—15 days ahead of schedule.
2. Army warehouses (200' x 800') erected at an average time of 5 days per warehouse.
3. Ten carloads of trusses for army hangars assembled and erected complete 21 days from arrival of first car at jobsite.

Cases such as these indicate the importance we place on service and on cooperation with architects, contractors, engineers and management.

We suggest that you consider the advantages of prefabricated timber—*economy, strength, long life*—for your building projects. Literature upon request. We are prepared to serve you in timber, allied structural materials.

Engineering in Wood

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WARD MAYER
STRUCTURES
INCORPORATED

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Protection

where the Shocks Originate

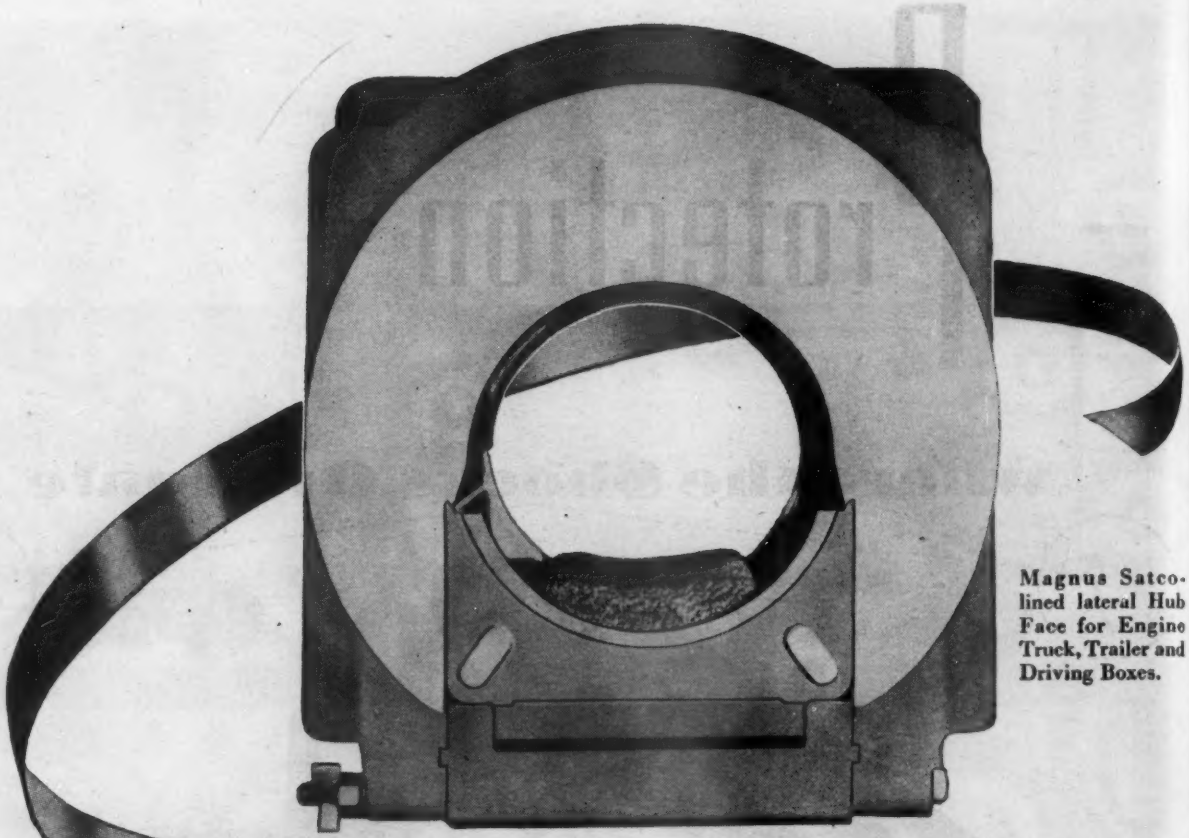
Westinghouse
NY-11-F Friction Draft Gear
Certified A. A. R.

Westinghouse Friction Draft Gears absorb buffing and pulling shocks *at the Couplings;* prevent accumulation of shock pressure on the underframe and entire car structure.

Over 98% of the cars in freight carrying service are A. A. R. construction and over 96% have Friction Draft Gears.

1048

Cardwell Westinghouse Co., Chicago
Canadian Cardwell Co., Ltd., Montreal

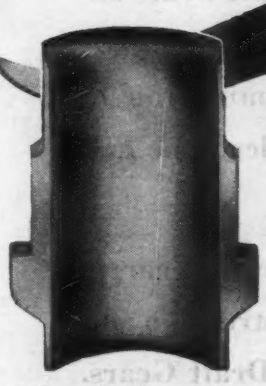


Magnus Satco-lined lateral Hub Face for Engine Truck, Trailer and Driving Boxes.

Satin

SATCO-FINISH

MINIMIZES BEARING FRICTION!



Magnus Satco-lined Journal Bearing.

Satco Bearing Metal conserves tin.
..is available now and future supply is assured.

SATCO Bearing Metal ★

MODERN HEAVY DUTY BEARINGS

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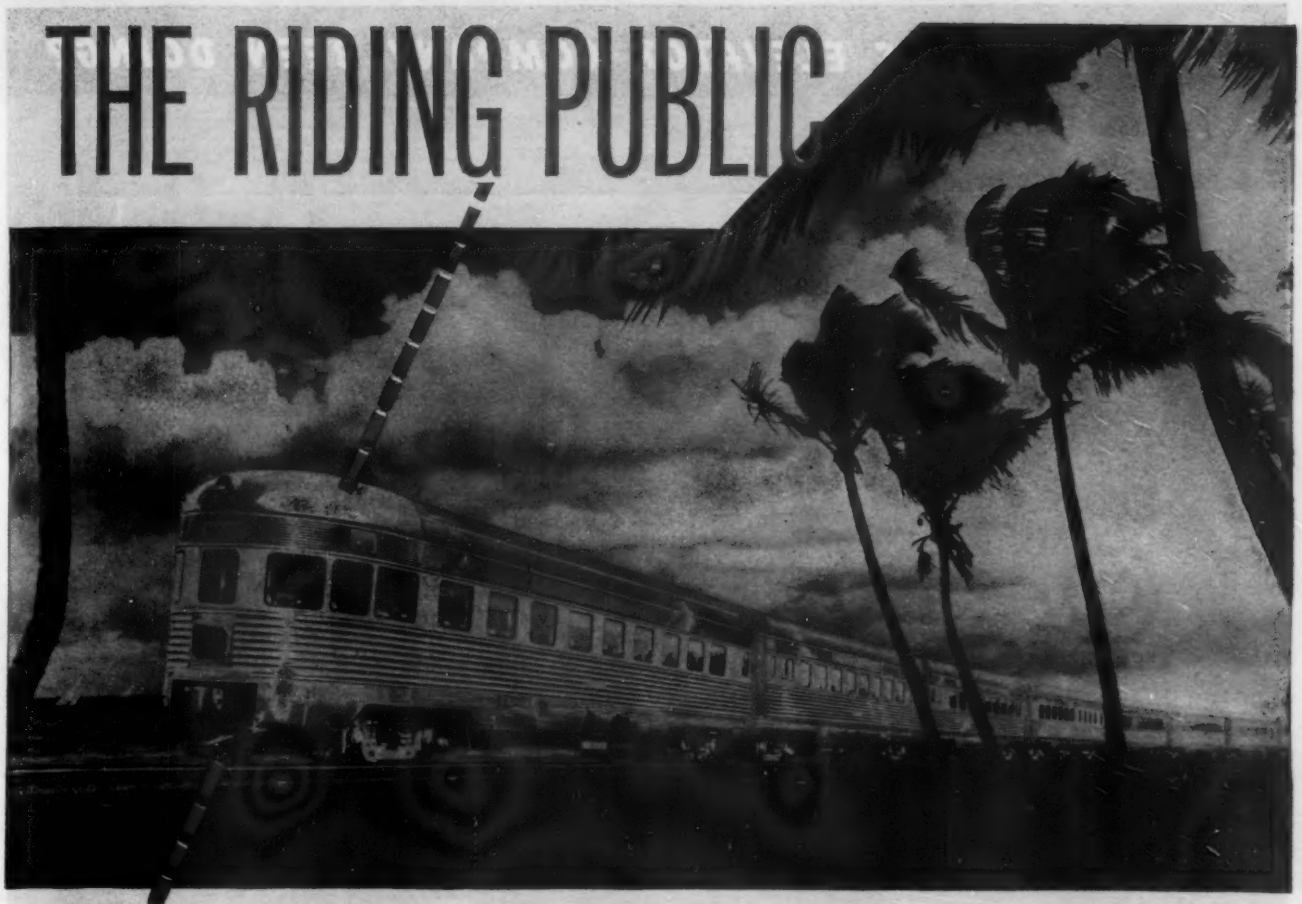
THE RIDING PUBLIC



Prefers Streamlined, Luxury Trains

Today, in our emergency, the riding public accepts almost any type of railroad service.

But tomorrow, passengers will choose the comfortable, fast trains just as they did in the years immediately preceding the war.

Streamliners of Republic ENDURO Stainless Steel have proved through operation over millions of miles that they attract the riding public—and enable railroads to operate at a profit.

The high strength-to-weight ratio of ENDURO insures safe, strong equipment free from all excess, profit-cutting weight. Its resistance to fatigue at both high and low temperatures increases the safety factor. Its resistance to corrosion permits the use of thin sections without hazard or need for painting. Its weldability means sound, economical construction. And its smooth, silvery surface is easy to clean—never needs repainting.

Whether for structural members or the exterior covering of cars and locomotives—for kitchen and serving equipment—for decorative effects—or for any other purpose, you'll find many substantial reasons for your use of Republic ENDURO. Write us and we shall be glad to tell you more.

REPUBLIC STEEL CORPORATION

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ENDURO STAINLESS STEEL

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Other Republic Products include Carbon and

WHAT HAS OTIS ELEVATOR COMPANY BEEN DOING?

...and what are they PREPARED to do?

The factories of the Otis Elevator Company have been devoted one hundred per cent to the war effort. That's not unique. That's the pattern of American industry.

however...

In addition to our large scale production of a great variety of highly precise mechanisms of war for the Army, Navy, and the Air Corps, we have continued to produce elevators. We have manufactured freight as well as passenger elevators for hospitals, ordnance depots, naval warehouses, and other priority installations.

this means...

Although our facilities, organization, and resources have enlisted for the duration and have gone all out for war production *as a matter of actual fact we have never been out of the business of manufacturing, installing, and servicing elevators.*

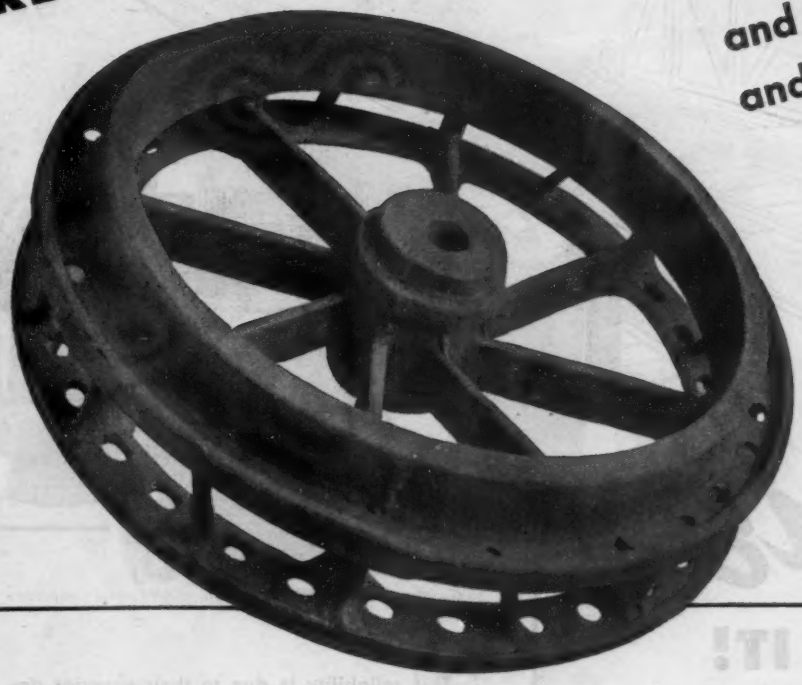
and so...

As our war work is reduced or terminated, this company is prepared — with no change in pace, and without missing a stride — to resume furnishing the highest quality elevators and escalators for all peacetime purposes.

Otis ELEVATOR COMPANY
OFFICES IN ALL PRINCIPAL CITIES

ARE YOU LOOKING FOR ECONOMY?

and Strength and Wear Resistance?



• Then here is a typical example of what you can do with steel castings.

This baggage truck wheel formerly was made up of 76 pieces, requiring 115 machine operations, plus a complicated assembly job.

Now, it is a one-piece steel casting, requiring only four machine operations, with no assembly cost at all! That's a real saving.

Consider the advantages steel castings offer you—strength, rigidity, scientific weight distribution, low finishing and assembly time, plus any combination of steel properties you can secure by any other method of fabrication.

Whatever you make, or plan to make, this is something for you to look into. Careful research and broad experience enable steel foundries to help you make a better product. And it can be proved!

Ask your steel foundryman, or write for information to Steel Founders' Society, 920 Midland Bldg., Cleveland, Ohio.

MODERNIZE AND IMPROVE YOUR PRODUCT WITH

STEEL CASTINGS

LEFT *Alone*...

AND LIKING IT!

● Housed in a small, unheated shack, left alone except for infrequent visits by a maintenance man . . . and they thrive on it! For these air-cooled Gardner-Denver compressors were designed for just this type of service. They operate dependably with a minimum of attention on signal or switch service along the right of way.

Gardner-Denver "WX" type air-cooled compressors have earned the confidence of railroad men. In millions of miles of service on Diesel-Electric locomotives . . . in yards, shops and power plants as well as on signal service, they have gained a reputation for dependability and exceptional performance.

Gardner-Denver "WXE" Two Stage Air-Cooled Compressor

This reliability is due to their superior design, which includes such features as:

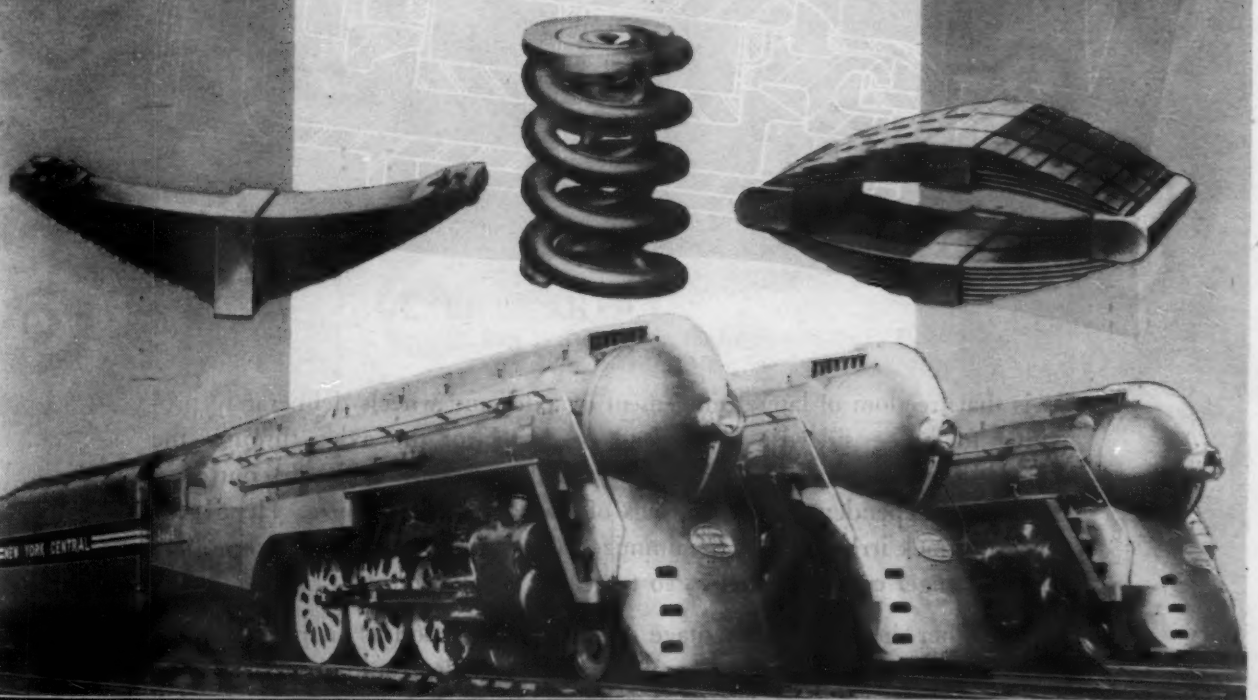
- **Integral counterweight and drop forged alloy steel crankshaft that assures smooth-running operation.**
- **Heavy circumferential cooling fins that eliminate cylinder distortion . . . provide extra strength and cooling surface.**
- **Crankshaft mounted on Timken tapered roller main bearings.**
- **Accurate and reliable pressure control.**
- **"Air-cushioned" Duo-plate valves that prevent air leakage.**

For complete information on "WX" type compressors, write Gardner-Denver Company, Quincy, Illinois.

GARDNER-DENVER *Since 1859*

"Railway" Springs for Easy Riding

WHETHER it be for cars or locomotives, springs must be employed that provide more than easy riding qualities, they must deliver long dependable service if greatest economy is to be achieved. Only long experience, a trained personnel, up-to-the-minute plant facilities, laboratory research and high grade materials can provide these qualities. You get all in "Railway" Springs.



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AMERICAN LOCOMOTIVE COMPANY

RAILWAY STEEL-SPRING DIVISION

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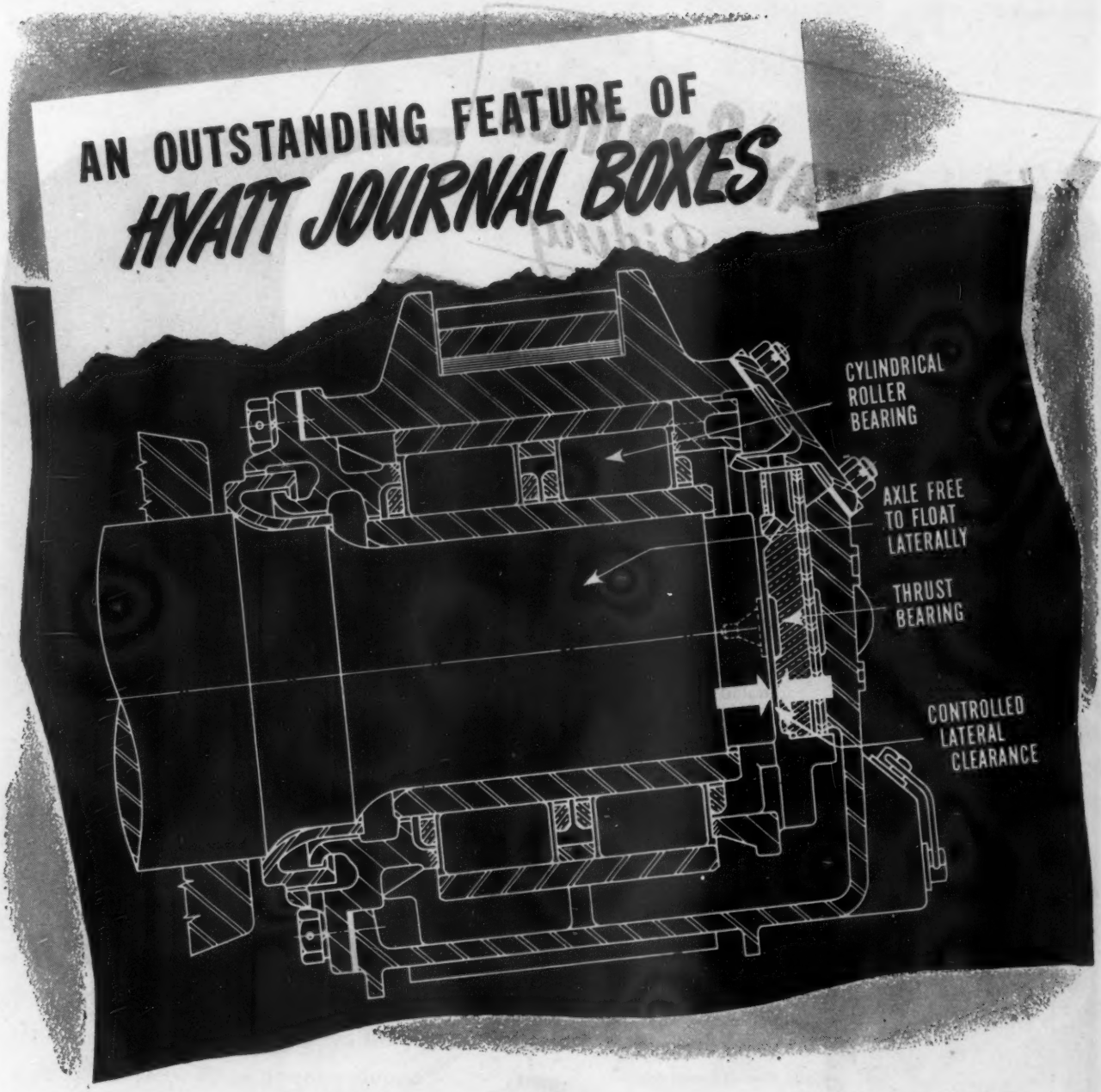

—is that freedom of lateral movement of axles and wheels deliberately provided for. The sidewise movement, or travel, of the axles through the cylindrical roller bearings which carry radial loads only, is closely controlled between independent thrust bearings of special analysis bronze. Hence, the effect of track irregularities is minimized thus promoting that ease of riding and passenger comfort which is so typical of Hyatt equipped cars.

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Harrison, New Jersey • Chicago • Detroit • Pittsburgh • Oakland, California

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered in U. S. Patent Office.

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Setting forth the 5-4 decision of the Supreme Court on March 26 granting the state of Georgia the right to sue 20 defendant roads in that court under the anti-trust laws

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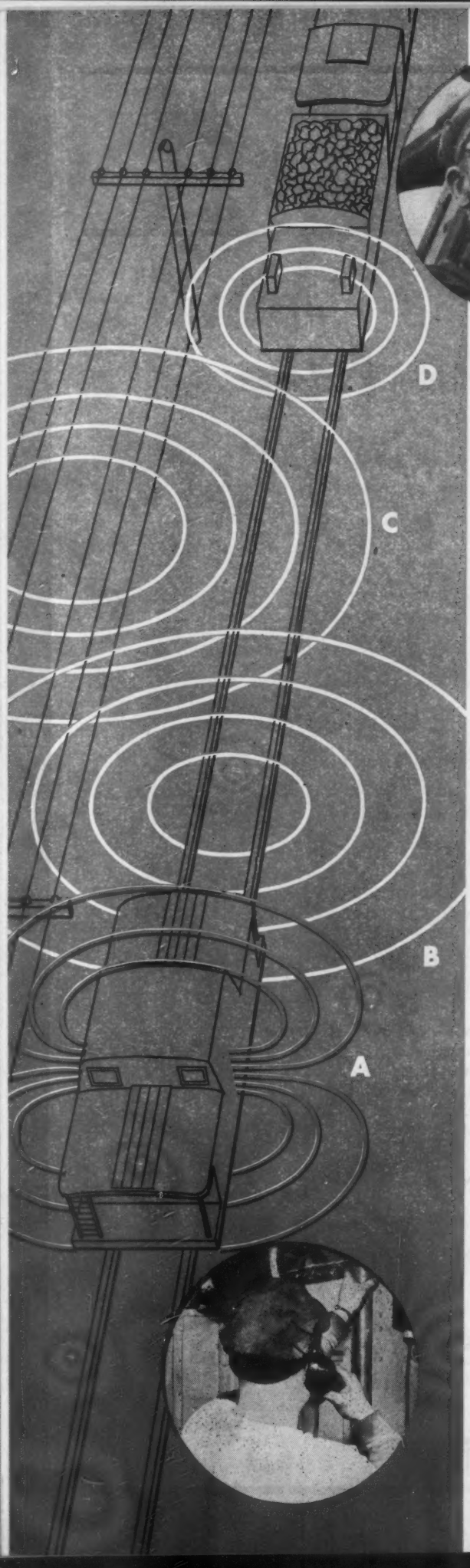

The A B C D of "Union" I.T.C.

The standard receiver and transmitter used in the "Union" Inductive Train Communication system looks like an ordinary telephone handset, provided with a press-to-talk button in the handle. The microphone is built into the mouthpiece.

When the trainman speaks into the microphone, the sound waves are impressed on a carrier wave which, after suitable amplification, is fed to a *transmitting loop* on the vehicle.

The energy of the transmitting loop produces a magnetic field represented at A. This induces a voltage in the rails and, to a lesser extent, in the line wires. The current in the rails produces a magnetic field represented at B, which induces a voltage in the line wires. The resultant line-wire currents carry the communication over the territory.

The currents in the line wires produce a magnetic field represented at C. This field induces a voltage in the rails, and the resultant current produces a magnetic field represented at D. This magnetic field links the receiving coils which may be placed at any convenient point on the vehicle, and so inductively produces in them a voltage for operation of the receiver.

For convenience, fields B, C and D are shown separately. Actually, inductive transference of energy from rails to line wire and from line wire to rails is continuous.

"Union" I.T.C. has proved the value of *inductive transmission* through years of regular use in yard and road service. Fifteen installations have already been made and two more are now under way.

UNION SWITCH & SIGNAL COMPANY

SWISSVALE, PENNSYLVANIA

NEW YORK CHICAGO ST. LOUIS SAN FRANCISCO

The Week at a Glance

STEAM STEPS AHEAD: Following the announcement in last week's issue of a tender-in-front, high-speed, high-power, geared-turbine steam locomotive which the Pennsylvania has designed, there comes this week a disclosure of the C. & O.'s plans to build three coal-burning steam-electric locomotives, also characterized by revolutionary features. As explained in the news pages, this engine also carries the coal supply at the head end; the cab comes next; the boiler is in the center section; the turbine-driven electric generators are in the rear. While novel in many particulars, this design, the road says, is not strictly experimental. Intended to be capable of 100 m.p.h. speed under full load, it will be used to power streamlined trains.

●

CAUSE OF CHAOS: The governor of Georgia, with the Department of Justice lurking on the sidelines, has found a way by which the nation's rate-making machinery, now functioning under close government supervision by processes developed through decades of painful experience, can be effectively and permanently disabled. The 5-to-4 decision of the Supreme Court, reviewed in this issue on page 584, which allows the state to sue for an injunction against the operation of the conference method of making joint rates, on the ground that the railroads thus have become conspirators in violation of the anti-trust laws, opens the way to chaos, the Chief Justice pointed out. Unrestrained competition in rate-making, the advertised goal of some of the most conspicuous and highly-placed opponents of present methods, could very well result from these litigious maneuvers, and the total elimination of private capital in transportation could very well result from unrestrained competition.

●

PULLMAN CASE: The determined effort of the government's Anti-trust Division lawyers to get Pullman out of the car-building business received another setback when the court last week again refused to order such action. Under the new ruling, a year from March 22 is allowed for the sale of Pullman Company stock by the parent company, or for the arrangement of terms under which the sleeping car operating business can be disposed of, either to the railroads or to independent buyers. As noted on page 590, the railroads and Pullman have gone ahead with post-war plans, in spite of the uncertainty introduced by the difficulty of determining how the sleeping car service will then be conducted, and spectacular improvements in service are in prospect.

●

SWITCHING ECONOMICS: The comments of dissenting Commissioner Alldredge, reported in a news story herein, emphasize some of the difficulties in which the I. C. C. appears to have become involved in its efforts to apply consistently the principles it has set up for itself for discriminating between car spotting services properly performed for shippers under line-haul rates and those for which switching charges should be collected. A log-jam of Ex Parte 104 proceedings having been broken by the Supreme Court's decision in the Staley case, the "carrier convenience" test has since been applied in a number of instances, with the result, according to Mr. Alldredge, that the commission is getting away from the intent of the law, away from a policy of considering "reciprocity of convenience, as well as of need."

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COUNTERBALANCING: One of this week's feature articles (page 579) outlines the objectives, the program, and the conclusions of recent tests for the measurement of the effects of inertia forces on the locomotive and on the track produced by counterbalancing. These were conducted by the A. A. R., and resulted in a plus-300 page technical report, certain parts of which are here summarized. The investigation has led to modifications of established counterbalance standards for high-speed service.

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DELIBERATION: While the government continues to profit at the rate of an estimated $20 million a month, the legislative machinery slowly grinds away at the land-grant rate repealer, which this week (as noted in this issue's news columns) was favorably reported to the House by that body's interstate commerce committee. Hurdles still to be surmounted, before the railroads are relieved of the burden of this long-since-discharged obligation, are passage by the House, approval by the Senate committee, passage by the Senate, adjustment of differences in the bills as first passed by the two houses, if any, and, finally, Presidential approval.

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ELECTRICAL EXPEDIENTS: The Canadian National's chief electrical engineer, R. G. Gage, describes this week (in a feature article on page 587) some of the wartime expedients adopted in that road's electrical installation at its Montreal terminal. Novel features include glass-bulb mercury-arc rectifiers supplying 2,400-volt direct current for traction and catenary structures fabricated from second-hand bridge steel and even from creosoted timber. Another section of the article is devoted to an explanation of the constant-potential car battery charging facilities at the new St. Charles coach yard, a part of the terminal development.

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TIME TO RETIRE: Reciting some of the steps taken by his own road in recent years to bring its property up to date, to increase track capacity and supplementary facilities, and particularly to fine-tooth-comb the system for retirable structures and equipment, in order to reduce its depreciation base, C. H. Mottier, vice-president and chief engineer of the Illinois Central, points the way—in a feature article on page 576—to the attainment of physically and financially streamlined railway properties conditioned to the competitive requirements of the post-war period. In a development of this theme, an editorial points out why retirements should not be postponed.

SINGLE COMMITTEES: Each house of Congress should have one committee responsible for the welfare of all domestic transportation agencies, rather than the existing haphazard arrangement under which separate committees assume the roles of promoters of particular forms of transportation, the highways, the waterways, and so on. One effect of such unification, as the leading editorial in this issue points out, should be a realignment of the political conditions under which the railroads, depending on private capital, compete with other forms of transportation—beneficiaries of large public expenditures for the facilities they use—for the means by which their services and properties can be improved. By such a reorganization of its machinery Congress can rectify the paradoxical situation—developed under this cumbersome arrangement of specialized committees—whereby the transportation agencies that have contributed least to the increase in transportation service performed for the nation at war obtained in the pre-war period the most capital for permanent improvements.

●

A POSSIBLE CONSEQUENCE: It does not follow, necessarily, that centralization of responsibility for all forms of transportation in one committee would lead to enjoyment by the railroads of publicly-financed capital improvements. It is within the realm of possibility, though, that the national transportation policy, interpreted by such a committee, might be so executed that the agencies of transportation that have proved to be of secondary usefulness in times of emergency might be required, through tolls or comparable fees, to participate in the compensation of the capital which has been appropriated to their use. The effect of this development would be to encourage private capital to enter into competition (via the railroads) with these beneficiaries of public expenditures.

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TRAIN-MILES CUT: At least 50 passenger trains, on runs varying in length from 18 to 395 miles, have been taken off in compliance with O. D. T. General Order 47, which bans operation of trains that have not recently averaged a 35 per cent passenger load. All passenger service has thus been discontinued on several lines. One result of the order has been a burst of criticism of the O. D. T.—and of the railroads—from communities affected by these service slashes. The trains affected are listed in the news section, all parts of the country being represented.

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SPENDING MORE: In spite of the restrictions on critical materials and the shortage of men, Class I roads reported more capital expenditures for equipment and improvements in 1944 than in any year since 1930. Of the $560 million total, considerably more than half—$328 million, in fact—went for cars and locomotives. For passenger-train cars, however, last year's outlay of less than $2 million was the smallest for any year since 1922. More details appear in the news pages.

IT'S A GREAT NEW DAY FOR RAILROADING

HOW FAST IS SPEED?

Steady, sustained speed
at a normal—
or better than normal—
rate of speed
is really fast.

That's what
General Motors locomotives
are constantly doing
in long-haul freight
and passenger service.

Why? Fewer stops
and faster acceleration.

ON TO FINAL VICTORY
BUY MORE WAR BONDS

GENERAL MOTORS
LOCOMOTIVES

ELECTRO-MOTIVE DIVISION
GENERAL MOTORS CORPORATION
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RAILWAY AGE

A Paradox in Governmental Dealing with Transportation

What more arresting paradox is there in the way this nation has dealt with its domestic transportation than this: That the one agency, the railroads, which were to be called upon to carry 88 per cent of the increased freight load arising from the war had nothing whatever, net, spent in capital improvements to their plant in the decade preceding the war, while billions were expended to improve highways and waterways which in the hour of the nation's greatest need have been able to contribute, respectively, zero per cent and 6 per cent toward the increased movement required? Furthermore, the railroads which were surrounded by political conditions in the 'Thirties which made it impossible for them to add anything, net, to their plant have been called upon to quadruple their production of passenger service; while the highways, the recipients of billions of largesse from the public treasury in the 'Thirties, yielded 28 per cent less passenger service in 1943 than they did in 1940.

Increase in Ton-Miles 1940 to 1943
(Source: I. C. C. Annual Reports)

By all forms of transportation	407,568 Million
By railroad	358,497 Million
By highway	† Million
By inland waterway	24,356 Million

† Decrease 301 Million

Is this the preservation of the "inherent advantages" of each form of transportation, calculated to provide for the nation a transportation system "adequate to meet the needs" of commerce and the national defense, which Congress proclaimed in 1940 as the "national transportation policy?" Obviously not. Such a policy would foster capital expansion in that part of the plant which wise foresight could have predicted would have to assume the bulk of an emergency load and would have minimized expenditures on plant expansion which would be of only secondary utility in a time of national emergency. Or at the very least, adherence to this policy would have prevented the financing of ancillary and secondary transport facilities in a manner to inhibit capital outlays on that part of the plant destined to be the nation's main reliance.

The Illogic Lies in Congress

The primary source of this unbalance and illogic in the comparative development of the different forms of transportation lies in Congress, where several committees serve as promoters and providers of public funds for particular forms of transportation—with no responsibility to concern themselves with even the continued existence of any agency other than the one committed to their care.

Authorizations for "federal aid" for highways are dealt with in the House by the roads committee and in the Senate by the committee on post offices and post roads. These committees have recently sponsored successful legislation calling for the expenditure of $1½ billion of federal money to be matched by an equal amount of local tax money—$3 billion for post-war highways to be expended without a thought as to whether or not the public interest requires such an addition to the highway part of our transport plant more than, for example, to the railway part; and without a care as to whether or not $3 billion of tax money poured into highways will make it harder or impossible for *private* capital to be raised for railway improvements.

Haphazard Political Game

These highway committees are not to be blamed for this condition. They are taking good care of the one responsibility given to them. It is the same with waterways. Authorizations for these developments are sponsored by the rivers and harbors committee of the House and by the committee on commerce in the Senate. Neither of these committees is given any responsibility for the adequacy of railway or highway facilities and, as a consequence, their legislation goes before Congress without having been tempered to any degree by consideration of the possibility that the money they ask for might be spent to greater advantage on some type of transportation other than the one they are assigned to foster.

The railroads get left out in this haphazard political game of capital supply because their plant is in private ownership. Obviously, the resources which this nation can afford to put aside for improvements to its transport plant should be parceled out where they will do the most good without prejudice for or against any one type of transportation—and this requires putting legislative guardianship over capital supply for all varieties of transportation into one committee of each house of Congress. Such action would not, necessarily, mean appropriating public funds for railroad improvements, but, if that is to be avoided, it does mean the levying of fees and tolls on the beneficiaries of governmental appropriations—so that private transportation capital which depends upon compensatory rates from its beneficiaries will not be competitively discouraged from making "appropriations" also.

Do High Taxes on Business Help the "Common Man"?

There is a disastrously fatal error too widely current that the more business is taxed the better off everybody else is—especially labor and consumers. Henry K. Norton, trustee of the New York, Susquehanna & Western, has shown us some figures of his which demonstrate that taxes not too high to permit a business to grow are a benefit to everybody—consumers, labor, and even to the government, which will get more in the long run from taxing a growing business moderately than from taxation so high as to prevent growth. Here is how his figuring goes:

A typical small business might be, and often has been, started in this way: A man with $2,000 of capital buys an equity in a garage or small shop and does in a year a gross volume of business equal to 10 times his capital, or $20,000. Typically, in such a business, this man would spend two-thirds his gross, or $14,000 for easy figuring, in wages—hiring 7 employees. His profit would be 25 per cent of his capital, or $500. If income taxes were only 10 per cent, this man would have $450 net profit after taxes the first year; and typical experience would be that he would take out 25 per cent, or $110, of this net in dividends and put the remaining $340 back in his business.

The next year, therefore, he would do $23,400 of gross business instead of $20,000, pay out $16,000 in wages instead of $14,000, hire 8 men instead of 7, pay $58 taxes instead of $50, and invest $390 more in the business instead of $340. At the end of 25 years under such progression, a typical small business thus conducted would be hiring 280 people with an annual payroll of $560,000 and would be providing consumers with $841,500 of products annually—which certainly would be an advantage both to labor and consumers.

Suppose, instead of taxes at the rate of 10 per cent, they were 100 per cent. On this basis (assuming that the man would have gone into business at all with such taxes) here is how a 10-per-cent-taxed business would compare with the 100-per-cent-taxed one at the end of 25 years:

	With 10% Taxes	With 100% Taxes
Total investment at end of 25 years	$98,000	$2,000
Aggregate sales in 25 years	5,700,050	500,000
Aggregate wages paid in 25 years	3,794,000	350,000
No. of jobs at end of 25 years	280	7
Total taxes paid to government	$14,266	$12,500

Even the government would have more taxes at the end of such a period by levying at a rate which would permit a business to grow rather than at a rate which would prohibit such growth. Nobody benefits so much as labor, because wages are the principal expense in most businesses, and the more business there is the more wages will be paid. The concern permitted to grow would be hiring more men each year, while the stationary one would stay just where it started. And, of course, the consuming public would have an aggregate of more than ten times the products from the growing business than it would get from the stationary one.

The man in the ranks—who for some mysterious reason is supposed to feel flattered when a wily demagogue cuddles him with some such epithet as the "common man"—is under no moral or political obligation to use his vote to favor "business" or "capital". He deserves, however, to be given information by his friends as to how he might go about promoting *his own* interests. Who is there among his professional champions who is giving him such information?

Do the Railroads Need Technically-Trained Men?

Why are the railroads so laggard, compared to other large industry, in their recruiting and fully using the services of technically-trained men That they are laggard can scarcely be questioned in the light of the results of a recent inquiry by the Committee on Cooperative Relations with Universities of the American Railway Engineering Association. Replies by the heads of 38 leading engineering schools to questioning by this committee revealed that these educators have found an almost complete lack of interest on the part of the railroads in recruiting the graduates of these schools. The reputation of the railroads in educational circles is that they offer few opportunities and small rewards for graduates of technical courses.

Some railroads, of course, are an exception to the general rule that the industry is indifferent to acquiring the services of men with a background of technical education. When, however, other industries hire these men and find them worth as much or more than the trouble and expense of engaging their services, only one of two conclusions is possible—either that the railroads are a peculiar type of industry which does not require the skill which technical training can produce, or that the railroads are not getting the advantage which their command of a larger share of available personnel with this educational background could give them. In an era of intensified competition, certainly the railroads cannot afford to ignore any means of improving or economizing their performance which is producing favorable results for their rivals. In such a time they also need men well-grounded in the fundamentals of science and engineering who have been forced by their training to learn to think and who can take new or old problems and solve them in new, ingenious or more efficient ways.

The fact is that the railroads do not need, proportionately, fewer technically-trained men than other large industries, but more. Probably no other single industry encounters such a wide range of technical problems, successful answers to which may mean millions. A large amount of research has been and is being done by the supply companies and by other agencies, such as that sponsored by the Association of American Railroads, but the initiation, as well as the intelligent analysis and application, of such research, requires men with sound technical training. Furthermore, such men, if they have the necessary qualifications of personality and are given railroad training, often make excellent material for management and executive positions.

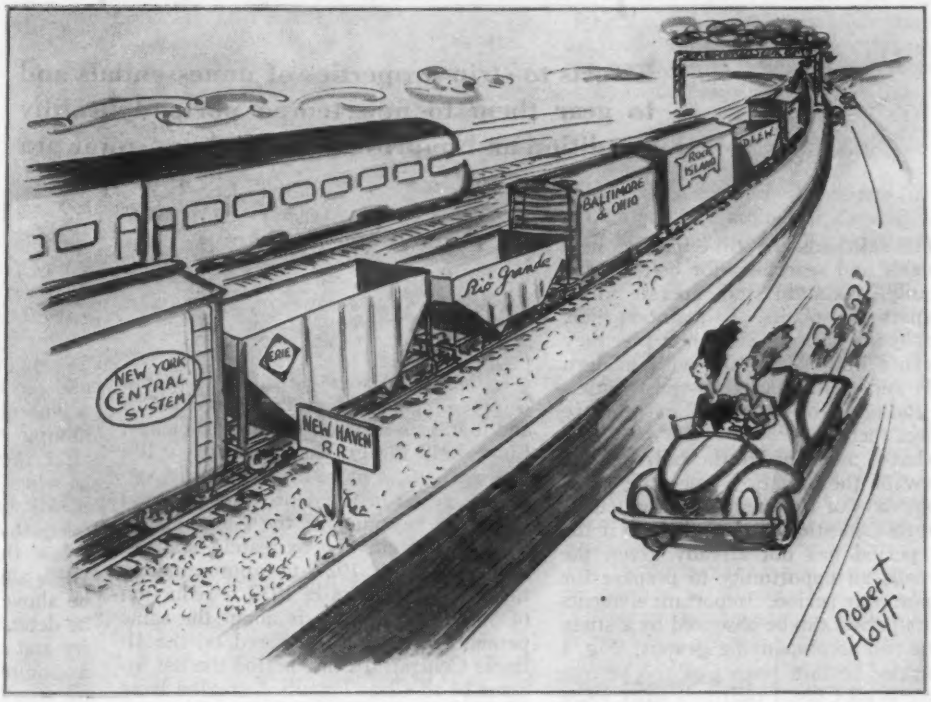
Although railway management, in general, has re-

cently awakened to the need for more research and also for modern methods of training employees, it does not yet appear to realize the parallel need for systematic selection and training of men destined for supervisory and managerial functions.

The head of one university engineering department summarized the situation as follows: "When the railroads hire college men they should hire them with the realization that they must give them practical training after they get on the job; that they must familiarize them with the railroad. . . . This type of man will be worthless unless he is given an opportunity to think. A race horse hitched to a plow soon becomes a plow horse."

To get prospective young men of such caliber the railways must offer salaries and opportunities for advancement equivalent to those that can be expected in other industries. As one dean of a prominent engineering school replied: "If the railways expect to get very many college graduates they will have to compete with industrial corporations which make a definite bid for our students. Every year we have 100 or more representatives of industry on our campus looking for our seniors. The large industries have apprentice courses and generally offer rates of pay which are very attractive."

Yes, Gals, and It's Lent a Few, Too



"Whooee, this railroad must be hard up for cars! Look—it's borrowed them from all over the country!"

Retirements

Since the onset of the war, the railways have altered their complexion considerably, especially as regards their fixed properties; so much in fact that many of their former employees returning from the war will "hardly recognize the old place." Everywhere, at passenger terminals, at shops and engine terminals, in yards, and out on the line, they will find evidences, in altered and expanded facilities, of how the railways threw in their full weight to meet successfully the country's needs for war-time transportation. At the same time, they are certain to be equally impressed by the absence of hundreds of other facilities, including branch lines, bridges, shop and terminal structures, and a wide range of roadway buildings from passenger stations to tool houses—evidence that orderliness and economy were not overlooked while intensive efforts were being made to build and expand to meet war demands.

On the Illinois Central System alone, returning employees will find more than 3,300 fewer items of fixed property, removed in a continuing retirement program of the last three years to rid the railroad of unused, tax-eating, maintenance-consuming, and often unsightly facilities. Through this program, which involved the retirement of seven unprofitable branch lines with a combined length of 167 miles of tracks, several hundred buildings, and a total of more than 16½ miles of bridges, the road's capital account was reduced by more than 19 million dollars, according to a statement by the vice-president and chief engineer of that road before a recent meeting of the Western Society of Engineers, reported in this issue. Significant as this fact is in itself, it is more impressive when it is realized that this retirement from capital account exceeds by approximately 3 million dollars the total war-time additions that were made to this account for roadway property during the same period. And still more significant is the speaker's comment that "even with these reductions in our capital account, and in the length of bridges and tracks, we now have a railroad of greater traffic-handling and earning capacity than ever before."

Indeed, "thar's gold in them thar hills." This was demonstrated widely on the railroads during the depression years as they trimmed their properties at every turn to effect economies, and now again during the past three war years as they have pruned further with a sterner hand to reduce operating costs and to secure much invaluable material, in many cases not available from any other source.

And the end of desirable and economy-promoting retirements is not yet, and never will be, so long as the railways are alert to adjust their properties to new conditions and demands—to new opportunities—and the transition that will be needed to meet the needs of the post-war period is certain to afford such opportunities in a large way.

Past Prepares Railroads for Future

Efforts to strip properties of nonessentials and to gear them to new tempo portend healthy condition and improved service in post-war era

By C. H. MOTTIER
Vice-President and Chief Engineer
Illinois Central System, Chicago

THE railroads are still exploring new fields and searching for better ways to build, maintain and operate their transportation plants. To maintain their place in the nation's economic life, they must not only keep pace with modern needs and trends but they must anticipate the needs of tomorrow and prepare to meet them.

What is the future of the railroads? A review of the situation since the prosperous days of 1929 may be enlightening as to this question, and also show if the war period has not already given the railroads an opportunity to prepare for the post-war period. Important elements of this period can be observed by a study of the two accompanying graphs. Fig. 1 illustrates certain phases of the performance of all Class I railroads since 1926. Fig. 2 shows similar information for the Illinois Central System. Considered together they show that, in the main, conditions on the Illinois Central during this period followed closely the general pattern of other railroads.

Fig. 1 shows the relation between freight, passenger and total operating revenues, net income and maintenance of way and structures expenditures. The graphs tell the story of the depression tragedy which, in some respects, has been beneficial to the railroads in that it forced them to adopt drastic economies and to improve their operating efficiency. Since 1940 the graphs suggest new life and, perhaps, a more brilliant future.

As a result of the depression the total operating revenues of the Class I railroads fell from approximately six billion dollars in 1929 to approximately three billion dollars in 1932, a reduction of 50 per cent. This is about the same percentage decrease suffered on the Illinois Central. In this period the net income of all Class I roads decreased from approximately 900 million to a deficit of approximately 140 million, and from 1932 through 1938 a deficit was actually shown, while the railroads were on a very lean diet.

The activity resulting from the beginning of the war in Europe increased revenues and net income slightly in 1940. A more substantial increase occurred in 1941 due largely to our preparedness activities. Then came Pearl Harbor and the unprecedented increase in business occasioned by our war effort which was reflected immediately in a proportionate increase in revenues. In 1944 freight revenue was about four times that received from passenger traffic. However, the increase in passenger traffic in the last three years has been at a more rapid rate proportionately than in freight, the passenger increase being 248 per cent and the freight increase 57 per cent.

There is no accurate basis for determining how rapidly traffic will decline after the war, nor what the traffic will be when conditions are again normal. It is safe and conservative to assume, however, that post-war traffic will not fall below that handled by the railroads in 1940, and that, in all probability, it will be above that figure. Obviously, it will be determined largely by business activity and the total national income which are quite speculative. At the same time, on account of the possible change in the purchasing power of the dollar, and in the passenger and freight rate structures, the revenue and net income to be derived in the post-war period from the assumed 1940 volume of traffic might differ considerably from those actually received in 1940.

This is an abstract of an address before a recent meeting of the Western Society of Engineers, Chicago.

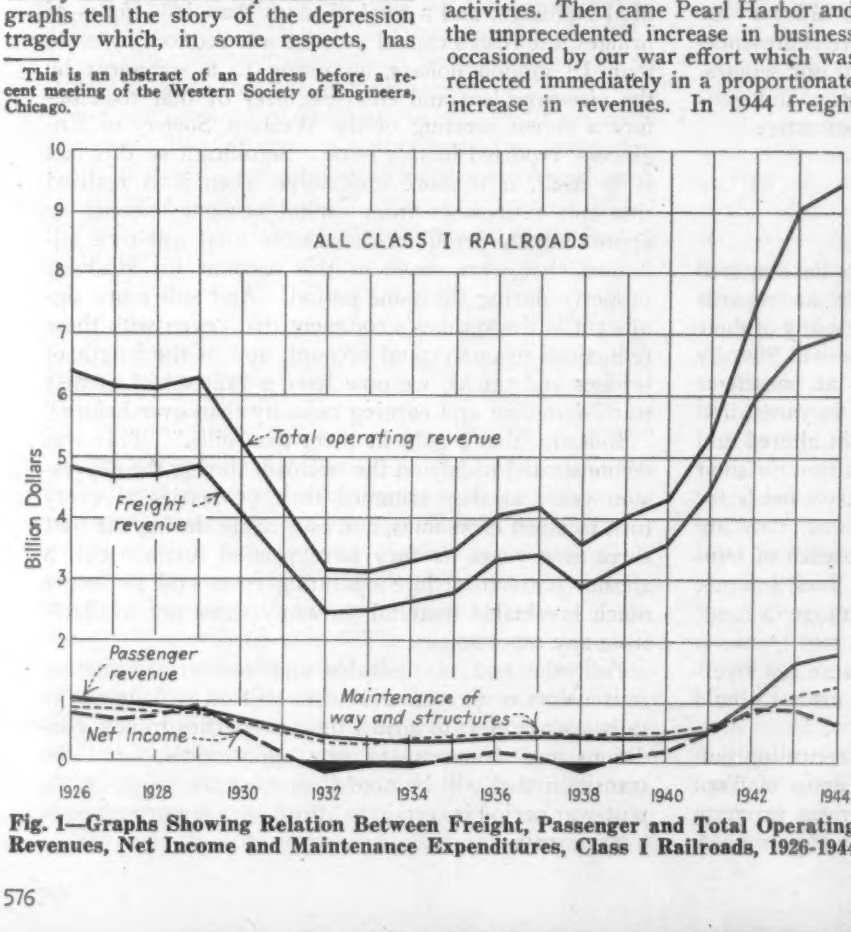


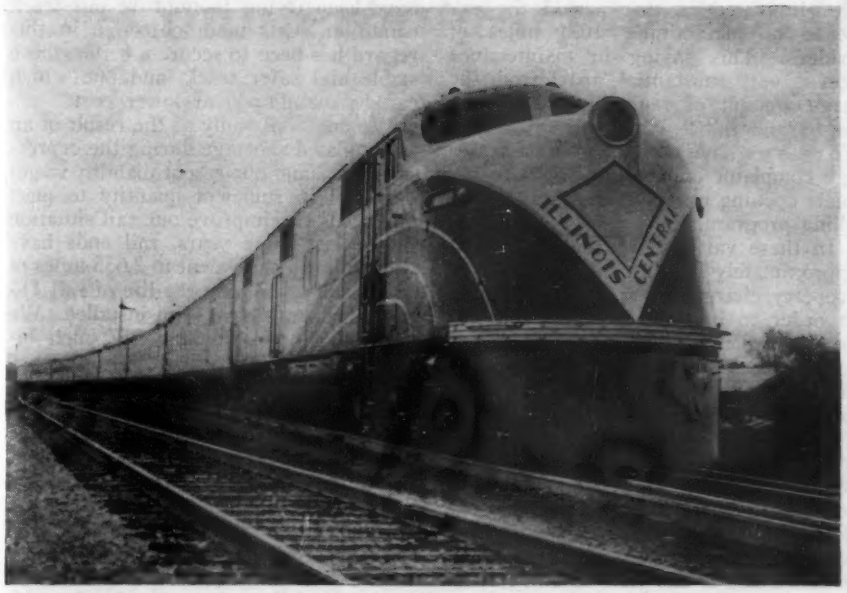
Fig. 1—Graphs Showing Relation Between Freight, Passenger and Total Operating Revenues, Net Income and Maintenance Expenditures, Class I Railroads, 1926-1944

Maintenance Up

As revenue and income decrease money available for maintenance also decreases. During the depression period when the amount available for maintenance was determined, not by the need but by the small amount in the practically empty cash drawer, all we could do was to keep alive and hope for better times ahead. Maintenance expense increased in 1942, but not in the same proportion as did revenue and net income. The slope of the maintenance curve did not turn sharply upward until 1943. On the Illinois Central, as shown in Fig. 2, the maintenance curve turned upward in 1942 in response to greatly increased traffic and revenue.

Fig. 2 presents graphs reflecting conditions on the Illinois Central, which are comparable to the graphs for all Class I roads shown in Fig. 1. For the sake of simplicity, however, the freight and passenger revenue curves have been omitted in Fig. 2 and have been replaced by a curve showing the gross-ton-miles of freight handled, to show the close relation between our freight tonnage handled and total operating revenue. Theoretically and actually, there should be a definite relation between the gross-ton-miles handled and the expenditure for maintenance of way and structures.

The Illinois Central did not go into receivership, although its net income during the depression was proportionately less than that of Class I railroads



To Run High-Speed Trains Safely Requires Good Track with Fissure-Free Rail

as a whole. Actually, during the ten years 1931-1940, inclusive, we were on a starvation diet and survived only because of the high standard to which the property had been maintained prior to the beginning of the depression.

There was a rapid increase in revenue in 1942 over 1941, and we made comparable increases in maintenance expenditures. Our net income graph flattened out in 1943 and turned abruptly downward in 1944, in spite of the very substantial increase in revenues in those two years. This drop in net income was caused by heavy tax payments, which in 1944 amounted to more than $59,000,000, or approximately 22 per cent of the total operating revenue.

Effect of Depression

The effect of the depression, when coupled with the increased revenues of the last three years, has improved the financial condition of the railroads. In the last three years the fixed obligations of the Illinois Central in the hands of the public have been reduced $86,493,000, and our annual interest charges have been reduced $3,219,000. The necessity for reducing expenditures and for improving efficiency resulted in the abandonment of unprofitable branch lines, a reduction in the number of employees, and the development of many improved transportation methods and facilities. The Illinois Central is a good example of the drastic steps taken in these directions to reduce expenditures, steps which have carried through to the present time.

In 1929 we had four grand divisions with four general superintendents. These have been eliminated and general supervision of the entire system is now concentrated in the general office in Chicago. In 1929 we had 20 operating divisions; today we have 13, a reduction of 35 per cent. In 1929 we had 1,326 section foremen; today we have 699, a reduction of 47 per cent. In 1929 we had 83 track supervisors; today we have 70, a reduction of 16 per cent. These are indicative of permanent economies which resulted from the depression.

The Illinois Central had made a valiant and successful fight against the sheriff. There was ample evidence on our property of that struggle and of the starvation diet on which we had been existing during the depression. However, we were determined to handle our war-time traffic efficiently and to stay in business after the war. It was up to us to get the property in shape as promptly as possible, and to gear such improvements as were to be made into an efficient post-war transportation machine which could be operated and maintained at minimum expense. However, because of our large indetedness, we wished to keep capital expenditures to a minimum.

I. C. Prepared Early

We prepared for the heavy increase in traffic. We built new passing tracks and yards, and extended existing passing tracks and yards. This expansion of facilities occurred largely in 1942, although some of it extended into 1943. By the middle of 1942 we became convinced that the war would last at least three years, and that as it progressed we would be faced with increasing restrictive regulations, material and labor shortages, greater material and labor costs, and increasing inefficiency of labor, all of which would progressively increase the cost and difficulty of doing work. We decided, therefore, to prepare our property to handle the war traffic as quickly as possible.

During the depression, such funds as were available were spent almost exclusively on main line tracks. Branch lines, yards, mechanical facilities, stations, offices and roadway buildings had to be neglected. It was imperative now, however, that these be put in a more serviceable condition, as many, not used for years, would again be needed. The work done in the last half of 1942 and in 1943 proved most helpful. Since then it has been increasingly difficult to do work because of the shortage of both labor and material. If we had not acted promptly the Illinois Central would not have been able to handle its war traffic as efficiently as it has.

The Interstate Commerce Commission, effective January 1, 1943, had or-

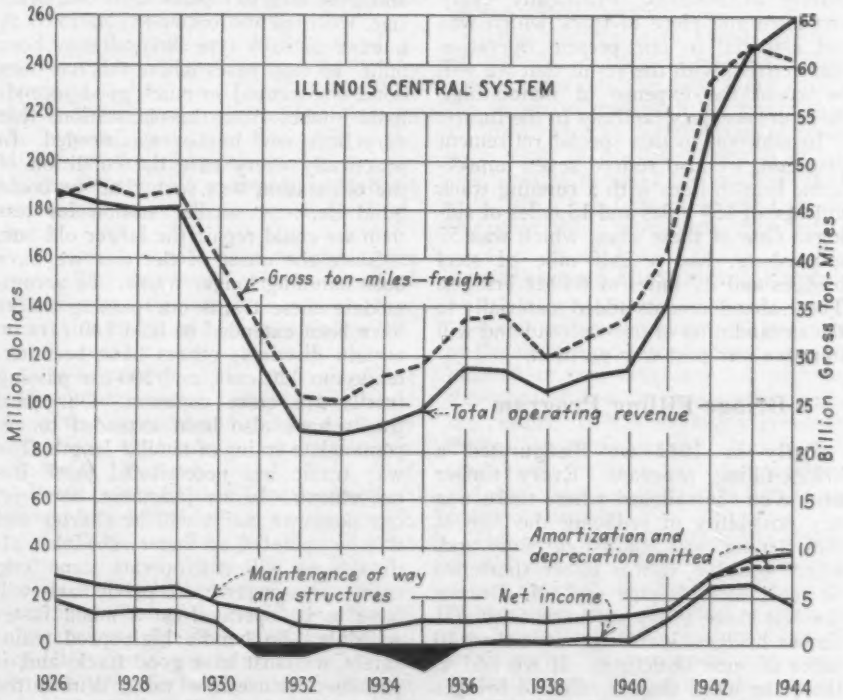


Fig. 2—Graphs, Comparable to Those in Fig. 1, Showing Conditions on the Illinois Central System, 1926-1944

dered the Illinois Central to inaugurate depreciation accounting for certain of its roadway accounts. Prior to that date the full value of retired property would be charged to operating expenses or to profit and loss. After that date annual charges would be made to a depreciation reserve for those accounts classed as depreciable property. While for several years, as a policy, we had been retiring facilities no longer needed, we felt that a more detailed survey should be made of all the property with a view to locating every additional item which could be retired, thus streamlining the railroad, reducing our depreciation base, and relieving us of future maintenance expense.

Parties were organized on each division, including representatives from the chief engineer's office and the division organization, and a detailed inspection was made of the entire railroad, in some respects similar to the plan followed in federal valuation. To handle the large amount of accounting involved a special joint organization of representatives of the accounting and engineering departments was set up and a plan developed whereby group retirement authorities could be requested and issued in skeleton form to save clerical work and to expedite handling. As a result 2,500 items of property, with a value of $9,000,000, were retired in 1942. Arrangements were later made with the Bureau of Internal Revenue to permit the extension of this retirement program for the subsequent two years to cover a special list of projects approved by the Bureau. These items of property to be retired were excluded from our depreciation base.

The total number of items retired under the entire three-year program was 3,300, with a total value of approximately $13,000,000. Practically every structure and piece of track which was not essential to our present operation was retired, with the result that we will be saved the expense of maintaining these unnecessary facilities in the future.

In addition to this special retirement program, we also retired seven unprofitable branch lines with a running track mileage of 154 miles and 13 miles of sidings. One of these lines, which was 57 miles long, had a half mile of steel bridges and 2.7 miles of timber bridges. These abandonments added materially to the streamlining of our railroad and will improve our post-war position.

Bridge-Filling Program

Early in 1942 we inaugurated a bridge-filling program. Every timber bridge on the railroad where there was any possibility of reducing the size of the opening, was studied carefully and, where possible, it was either shortened or replaced with pipe and fill. During the last three years we have filled 651 timber bridges, involving more than 10 miles of such structures. If we add to these the more than 6 miles of bridges on the 154 miles of unprofitable branch lines abandoned in the last three years, we eliminated in that period the expense of maintaining 16½ miles of bridges. This saving in maintenance cost is very substantial, apart from the large amount of reuseable timber salvaged and the fire hazards eliminated. To date we have not had a single drainage complaint on account of an inadequate opening resulting from this bridge filling program.

In these various programs we spent approximately 16 million dollars on fixed property chargeable to capital account, in order to handle adequately our enlarged traffic, but we retired from our capital account more than 19 million dollars of roadway property, resulting in a net reduction in our capital account of approximately 3 million dollars. In spite of the fact that we built one new yard with 27 miles of tracks, and enlarged several other yards and built and extended numerous passing tracks, we have today 217 miles less track to maintain than we had at the time of Pearl Harbor. Even with these reductions in our capital account, and in the length of bridges and tracks, we now have a railroad of greater traffic-handling and earning capacity than ever before.

Passenger Stations Replaced

Between 1921 and 1942 passenger service had been discontinued on more than 2,200 miles of our railroad. There were numerous passenger stations in which no passengers were being handled. Many of these stations were two-story structures, with living quarters for the agent on the second floor, some of which had not been occupied for years. Most of these old stations were in desperate need of repairs.

Standard plans for small stations were made of four types—A, B, C and D—and were used to replace these old, oversize, wornout and outmoded stations. A number of each type have already been built. In most cases where this has been done, we secured so much good second-hand lumber from the old stations that very little new lumber was needed. In practically every case the condition of the old station was such that we could build the new smaller station for less than we could repair the larger old one.

Since the onset of the war we have been handling longer trains. To accommodate these trains our passing tracks have been extended to hold 140 cars on certain districts; others have been extended to 120 cars, and 100-car passing tracks are quite common. Our yard tracks have also been extended to accommodate trains of similar length. The war traffic has necessitated these improvements. In my judgment, however, our post-war trains will be shorter and will be operated on faster schedules, although we will still operate some long trains. Passenger trains particularly will have to be operated on a much faster schedule. To handle high-speed trains safely, we must have good track, and, if possible, fissure-free rail. Within the limitations of war-time restrictions and handicaps as to labor and material we have been trying to improve our track condition. Our main objective in this regard has been to secure a better, more stable and safer track, and one which can be maintained at lower cost.

We need rail badly as the result of an accumulated shortage during the depression years and our recent inability to get new rail in sufficient quantity to meet our needs. To improve our rail situation in the last three years, rail ends have been built up equivalent to 2,635 miles of track, and to prolong the life of rail 115 rail lubricators have been installed. We now have approximately 257 such lubricators.

Because of our inadequate rail condition and our inability to get new rail as needed, we have been inspecting the rail in track very closely. A record of the heats of all rail in our important lines is maintained and these lines are covered by a rail fissure detector car from one to three times a year. We own one detector car and hope to have a second delivered to us shortly. All rails of a heat are removed from track when the tenth transverse fissure failure is reported in that heat, and we do not relay in main line tracks, where a speed of 25 m.p.h. or more is permitted, relieved rails of a heat in which six or more fissure failures have occurred. We have gone to heavier rail, larger ties, larger tie plates, longer angle bars and better ballasts; have installed drainage, stabilized sections of roadbed, restored embankments, etc.

Faster Speeds

With our improved locomotives, and with the probability that train loads will be decreased, rather than increased, we do not anticipate that we will be justified in further reducing track grades. However, there are many places on our railroad where we should improve alinement to eliminate speed restrictions, and for the last two years we have made several such improvements.

Three years ago, as an experiment, we installed several No. 20 high-speed turnouts with 33-ft. curved switch points. We have now adopted that turnout as standard for our high-speed operations where its installation can be justified. We restrict speed through these turnouts to 40 m.p.h. but they ride reasonably well at 50 m.p.h.

During the last three years we have authorized or installed 79 spring switches in passing tracks and have adopted a policy, when relaying rail in our more important main lines, of installing No. 15 turnouts in place of No. 10 turnouts, so as to be in a position to install spring switches in these turnouts if and when they are needed. We now have 149 spring switches, which will be helpful in speeding up traffic.

We have adopted one-spot coal, water and sanding facilities for engines on our main lines, and we now have several such installations in operation. All of these improvements will be particularly helpful when it becomes necessary to reduce schedules.

Counterbalancing for High Speeds

Established rules modified as the result of an investigation by Association of American Railroads

[This article deals with a report on counterbalance tests of locomotives for high-speed service issued by the Office of the Mechanical Engineer, Mechanical Division, and Research Engineer, Engineering Division, in March 1944. This report, which contains over 300 pages, gives the results of the study of the Committee on Locomotive Counterbalance Standards of the Mechanical Division and of the Joint Committee on Relations between Track and Equipment of the Mechanical and Engineering Divisions of the Association of American Railroads, culminating in a series of tests for the measurement of the effects of inertia forces on the locomotive and on the track effected by counterbalancing. The article is confined to a presentation of the objects of the tests, the test program, and the conclusions drawn from the analysis of the test data. —Editor.]

IN REVIEWING the development of locomotive counterbalancing certain phases or questions have evidently been of continued interest throughout and it may properly be stated that these questions had not definitely been settled at the time the tests described in this report were undertaken. These are:

1—The proper relation or limitation of the amount of reciprocating weight with respect to the weight of the locomotive.

2—The amount of reciprocating weight that can be left unbalanced without undue disturbance of the locomotive.

3—The method of balancing the main rod, whether statically based upon the scale weight of each end or dynamically based upon its center of percussion.

4—The extent to which it is necessary or desirable to balance the out-of-plane effect of the revolving weights commonly referred to as cross-balance.

5—The extent to which it is necessary or desirable to balance the eccentric cranks and eccentric rods.

6—The amount of dynamic augment that can be tolerated by the track.

Obviously, these questions have assumed increasing importance as the speed of operation of locomotives has increased. The present A. A. R. recommendations for counterbalancing as adopted in 1931 and revised in 1934 were definitely shown to require revision by experiences on several railways with modern high-speed locomotives of the 4-6-4 and 4-8-4 types which kinked rails in regular operation although balanced in accordance with these recommendations. Accordingly, the Mechanical Division of the A. A. R. established a Committee on Locomotive Counterbalance Standards to give this matter thorough consideration, and C. H. Buford, vice-president of Operations and Maintenance Department, established a Joint Committee on Relation between Track and Equipment, consisting of representatives from the Mechanical and Engineering Divisions, to afford the necessary coordination between the interests of track and equipment on this and other matters.

The first step taken by the Committee on Locomotive Counterbalance Standards was to prepare a comprehensive analysis of the theory of locomotive counterbalancing. This afforded the background and basis for the analytical treatments included in this report. It was next decided that extensive field tests should be made of various types of locomotives and careful consideration was given to the plan of conducting these tests.

Test Program

It was decided that the following program should be followed for the tests.

The tests should be conducted on single track so there would be no reason to expect the rail to have better support under one side of the locomotive than on the other. Otherwise, the tests would have to be duplicated, running the locomotive in both directions, in order to determine the relative impacts on the rail under right and left drivers.

The rail should be 100 lb. per yd., a comparatively light section for high-speed main-line use. There should then be no question but what rail stresses in heavier rails would be less than in the 100-lb. section. Also, the higher stresses in the lighter rail section would afford somewhat more accuracy of measurement.

The track should have tie plates, ties and ballast that would afford a standard of rail support comparable with average main-line track and be suitable for 100 m.p.h. speed.

The alignment of the track should be tangent at the test section and should have an alignment and grades each way from the test section to permit test speeds of 100 m.p.h.

It was decided that four locomotives should be selected for the tests, one each of the 4-6-2, 4-6-4, 4-8-2, and 4-8-4 types.

The counterbalance condition of each locomotive selected should be checked and analyzed by the committee method to determine the amount of unbalance producing dynamic augment, the amount of reciprocating compensation and of reciprocating unbalance, and the locomotive should be tested with this counterbalancing (the same as used on the locomotive prior to the tests) to determine its effect on track and its riding qualities.

The main driving wheels of the locomotive should then be rebalanced by the committee analysis to provide the same effective reciprocating compensation and the tests repeated for comparison with the first series.

In order to determine the maximum permissible unbalanced reciprocating weight in terms of the total weight of the locomotive in working order, two additional series of tests should be run with each locomotive with different amounts of unbalanced reciprocating weight so the complete range of reciprocating compensation within feasible limits of operation would be covered.

Each locomotive should be tested at a speed of 5 m.p.h., at diameter speed, and at high speed—as near 100 m.p.h. as possible. In order to secure a good average, five runs should be made at each speed working steam; at diameter speed five additional runs should be made drifting.

It was decided that test equipment should be obtained to determine the vertical and lateral effects on the track, and the vertical, lateral, and longitudinal vibrations of the locomotives, the lateral thrusts applied by the driving boxes to the frame, and stresses in the main driver pedestal jaws.

Some changes were found necessary or desirable in this test program. However, in general, the tests were carried out in accordance with the program as outlined. Due to the shortage of power as a result of wartime demands, it was not possible to make the proposed tests with the 4-8-4 type of locomotive, but the other three types were obtained.

Analysis of Disturbing Forces

A comprehensive analytical treatment of the disturbing forces acting upon the locomotive was necessary for planning the counterbalancing tests and analyzing the results. It was obviously necessary that all counterbalancing calculations be made upon the same basis for each type of locomotive and each variation of the counterbalancing.

This work was divided into three principal divisions. The first division comprised an analysis of all the forces resulting from the revolving weights in the locomotive drivers, including the driving-wheel centers, crank pins, crank-pin hubs, main rods, side rods, eccentric cranks, and eccentric rods. The second division comprised an analysis of the

forces resulting from the steam pressure in the locomotive cylinders and the inertia of the reciprocating weights, including the piston, piston rod, crosshead, etc. The third division comprised a combination of the foregoing forces to determine the resultant disturbing forces acting upon or within the locomotive and tending to produce dynamic vertical loads upon the track structure, fore-and-aft shaking of the locomotive or nosing of the locomotive.[1]

The measured longitudinal stress along the center line of the base of the rail was used as a means of determining the vertical load applied on the rail—in effect weighing the vertical dynamic augment resulting from the counterbalancing.

An important part of the analysis of the counterbalancing consisted of comparing the measured stresses with the calculated stresses based upon the analytical dynamic augments. A close agreement between the two would serve to verify the analytical treatment of the counterbalancing.

The method of analysis of the stress-load relation in the rail has been studied by several investigators, particularly abroad, for many years past. Theoretical studies in some cases were supplemented with careful field measurements. The work of Dr. Zimmerman in Germany, Dr. Wasiutynski in Poland, Dr. Timoshenko in Russia and the United States, and Dr. Talbot in the United States should be especially mentioned. All came to the conclusion that the bending stresses and depression of the rail could be well analyzed by considering the rail as a continuous flexible beam on an elastic support. The formulas used by all of these investigators gave essentially the same results. Accordingly, this method of analysis can be used with full confidence.

The formulas were put into convenient form for use in the work of the Special Committee on Stresses in Track directed by Dr. Talbot and a full explanation is given in the Proceedings of the American Railway Engineering Association[2] and in the Transactions of the American Society of Civil Engineers.[3]

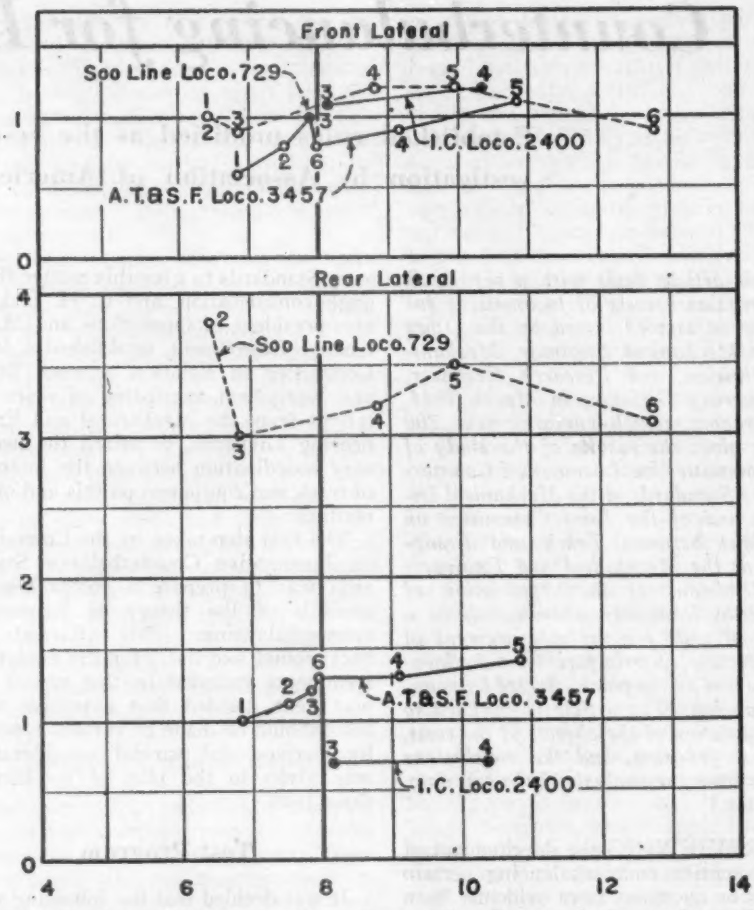


Fig. 1—Lateral Accelerations of the Locomotive Frame—A Comparison of the Mean Maximum for the Three Test Locomotives Operating at High Speed

Vertical scale: Mean maximum range of accelerations in units of g (32.2 ft. per sec. per sec.). Horizontal scale: Reciprocating unbalance in pounds per side per ton of locomotive weight in working order. Numbers on the curves refer to test series.

Test Equipment

The objective in planning the test was to determine the effect of counterbalancing both on the track and the locomotive.

Past experience had shown that the dynamic vertical wheel loadings applied to the track could be well determined from measurements of longitudinal strain in the base of the rail. For measuring the dynamic lateral forces, it was decided to use a modification of a roller-bearing tie-plate assembly which had been developed and used successfully on the Pennsylvania.

For determining the effects of counterbalancing on the locomotive it was decided to use accelerometers to measure the vertical, lateral, and longitudinal vibrations, to measure the lateral forces between the driving boxes and frame by special weigh-bar mechanism, to measure the strains in the main driver pedestals, and to measure the strain in the drawbar between the locomotive and the tender. During the course of the tests it was decided to measure in addition the main-rod thrusts, the steam pressure in the cylinders, and the variation of the sprung weight transmitted to the main driver.

Careful study was given to the selection of the type of equipment that would be most suitable. The electro-magnetic type of measuring equipment had received the benefit of several years of experience and progressive development. Specifications were prepared covering the features that were considered necessary, and the Hathaway Instrument Company was engaged to design and construct the equipment in accordance with the specifications. This equipment consisted of four oscillographs, each capable of making 12 simultaneous records; four control units, each of which was operated in conjunction with one oscillograph, to govern the sensitivity, rectify and filter the output from the gauges; two electronic-type oscillators for providing the necessary 2,000 c.p.s. carrier current for the gauges; 72 magnetic strain gauges, and 10 magnetic accelerometers. Part of this equipment was used for the track measurements and part for the locomotive measurements.

The stretch of main track selected was the same as used previously in conducting counterbalance tests with Chicago & North Western locomotives near Harvard, Ill. This track is part of the C. & N. W. short line between Harvard and Janesville, Wis. Traffic was favorable to the tests on this line since the railway has two single-track main lines between these points and a majority of all trains used the other line.

The track was laid with 100-lb. rail of 39-ft. lengths having about 1/16 in. head wear. The track structure consisted of 24 treated hardwood ties to the panel, 1:40-cant single-shoulder 7 in. by 10½-in. tie plates throughout, four-hole toeless joint bars, six anchors to the rail, and pit gravel ballast 12 in. or more in depth below the tie.

In operation of the Illinois Central locomotive, eight cars weighing 422 tons were used in the first twenty-two tests, after which the train was reduced three cars in order to obtain higher speed and minimum back-up movement.

During the first eleven test runs made with the Soo Line locomotive No. 729, four to five cars were used, and the re-

[1] Section IV of the report presents in detail the complete method of analysis.—Editor.
[2] Vol. 19, pages 878-896.
[3] Vol. 82.

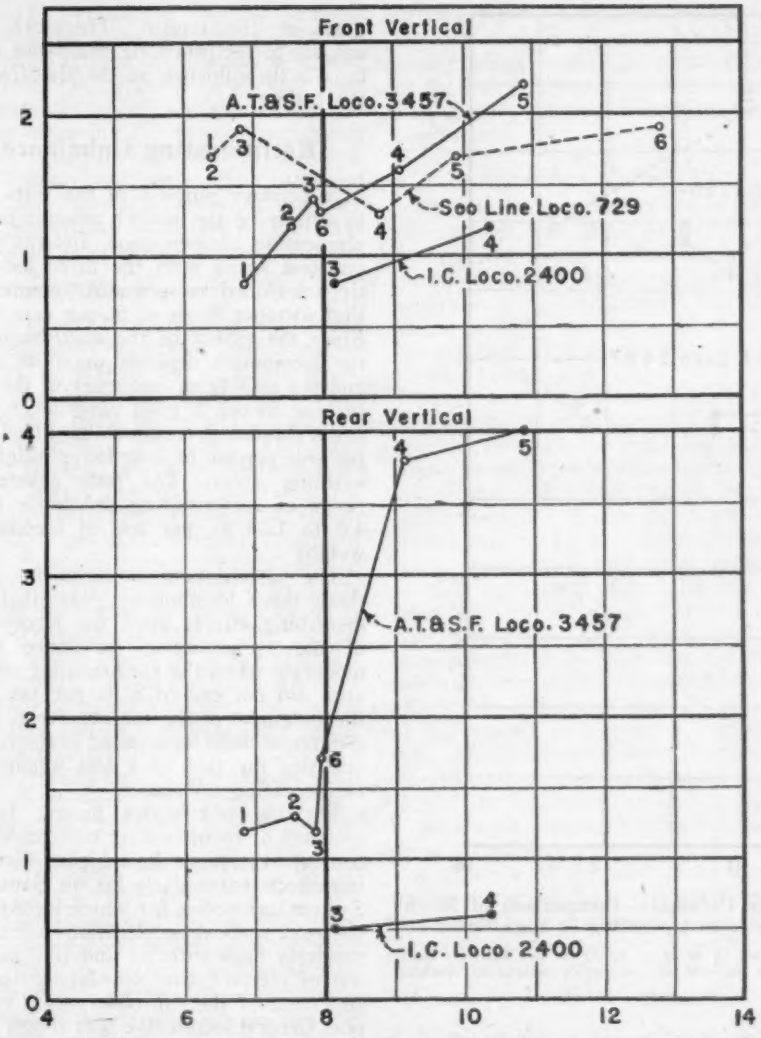


Fig. 2—Vertical Accelerations of the Locomotive Frame—Comparison of the Mean Maximum for the Three Test Locomotives Operating at High Speed

Vertical scale: Mean maximum range of acceleration in units of g (32.2 ft. per sec. per sec.). Horizontal scale: Reciprocating unbalance in pounds per side per ton of locomotive weight in working order. Numbers on the curves refer to test series.

mainder of the test was conducted with a three-car train.

A summary of the operation of the three test locomotives while making test runs is shown in the table.

Effect on the Locomotive

Acceleration of Locomotive Frame

The effect of the amount of reciprocating unbalance on the accelerations of the spring-borne mass of the locomotive is shown in Figs. 1 and 2. In these figures, the maximum range of measured lateral and vertical accelerations is plotted with respect to the amount of unbalanced reciprocating weight.

The front lateral accelerations, shown in the upper portion of Fig. 1, are of moderate magnitude and not greatly different for all three locomotives. In general, there is a small increase in the magnitude of the front lateral acceleration as the reciprocating unbalance increases.

The rear lateral accelerations show a slight increase in magnitude as the reciprocating unbalance is increased for the Santa Fe system locomotive only. Of most significance, however, were the high magnitudes of rear lateral accelerations for the Soo Line locomotive irrespective of reciprocating unbalance. This was attributed to the low lateral resistance of the trailer truck which varied from 6 per cent initial to 17 per cent of the weight on the trailer wheels. It is quite evident that other characteristics of locomotive design had far more influence on the rear lateral accelerations than the amount of reciprocating unbalance.

The measured lateral accelerations for each locomotive and each test series showed a definite relation with the calculated nosing couple due to the unbalanced reciprocating weight. This nosing couple is only moderately affected by a relatively large change in the amount of reciprocating unbalance. Furthermore, the engine and trailer trucks may be designed to confine the lateral accelerations within moderate magnitudes even with no reciprocating compensation. It is, therefore, evident that in determining the proper amount of reciprocating compensation for a locomotive, compensation for the nosing movement is of secondary importance.

The front vertical accelerations in the upper portion of Fig. 2 show a definite trend toward higher accelerations with increasing reciprocating unbalance, except for the Soo Line locomotive. The rates of acceleration are not greatly different for these locomotives and may be considered moderate. In the lower portion of this figure showing rear vertical accelerations, the curve for the Soo Line locomotive has been omitted due to the sensitivity of the accelerometer varying during the test. There was a very considerable increase in the rear vertical accelerations of the Santa Fe System locomotive for Series 4 and 5 to magnitudes that are excessively high. The rear vertical accelerations appear to have a definite relation to the drawbar buffing force and it seems quite probable that these high magnitudes for Series 4 and 5 may be primarily influenced by the drawbar and buffer characteristics.

The fore-and-aft accelerations were measured for Series 3 and 4 with the Illinois Central locomotive and for Series 2 to 6, inclusive, with the Soo Line locomotive. The measured accelerations corresponded closely with the calculated values based upon the mass of the locomotive and the fore-and-aft shaking force. The measured fore-and-aft accelerations increased with the amount of reciprocating unbalance but were of moderate magnitude.

It seems evident from the test measurements that the fore-and-aft disturbing force, because of its direct effect on the fore-and-aft accelerations and indirect effect on the vertical accelerations, should receive primary consideration in the arrangement of the counterbalancing.

Main Driver Pedestal Stresses

In Fig. 3 the maximum range of main driver pedestal stress for each test series measure at high speed is plotted for each of the test locomotives with respect to the amount of reciprocating unbalance. In 16 test series with the three locomotives the highest pedestal stress for the locomotive was measured in the left rear pedestal, except in the Sixth Test Series with the Soo Line locomotive.

For all locomotives it was found that simultaneous peak stress values occurred in diagonally opposite pedestals, indicating a twisting of the main driving axle in the horizontal plane and these peak values corresponded closely with the pin position for the maximum calculated nosing couple due to the inertia of the reciprocating weight. The maximum pedestal stresses in the high-speed runs for each test locomotive varied moderately during the several test series, but were no larger than the stresses measured at low speeds when the locomotive was accelerating.

It is apparent that main driver pedestal stresses are influenced by conditions other than the amount of reciprocating unbalance and piston thrust, such as clearances between the driving-box shoes and wedges and rod bushings clearances on the crank pins. In these

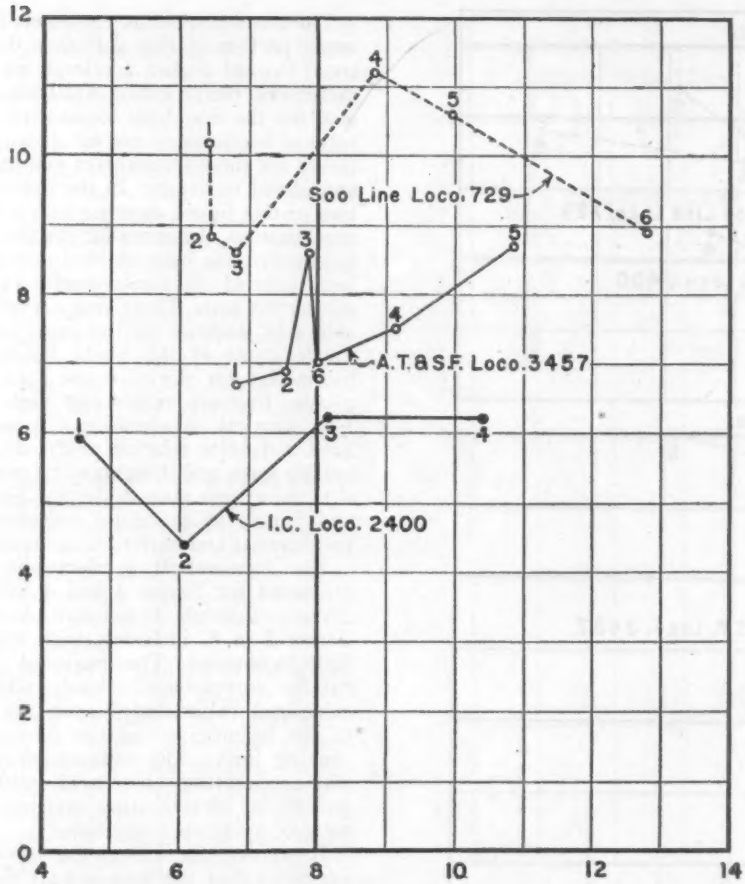


Fig. 3—Stresses Measured in the Main Driver Pedestals—Comparison of Mean Maximum Range for the Three Test Locomotives Operating at High Speed

Vertical scale: Mean maximum measured pedestal stresses in units of 1,000 lb. per sq. in. Horizontal scale: Reciprocating unbalance in pounds per side per ton of locomotive weight in working order. Numbers on the curves refer to test series.

tests, stresses measured in the main driver pedestals in high-speed operation for all locomotives were not excessive, regardless of counterbalancing.

Lateral Forces on Locomotive Frame

For the tests with the Illinois Central locomotive only, the lateral forces exerted by the driving wheels on the frame were measured with specially designed weigh bars. No definite relation was shown between these forces and the amount of reciprocating unbalance, and these measurements were not made for the other two locomotives.

Variation of Sprung Load

The variation in sprung load on the main drivers showed two principal characteristics. First, a cyclical change occurred during each wheel revolution, the sprung load being decreased as the dynamic augment increases, and vice versa. Apparently, an increase in dynamic augment increased the wheel depression on the elastic track structure, tending to release a part of the spring flexure and reaction. Second, a cyclical transfer of sprung load occurred over a period of four to five driver revolutions, between the right and left main drivers, reflecting a roll of the locomotive superstructure on the springs. This roll appeared to be primarily influenced by track surface and alignment.

The change in sprung load partially explains the scatter in the measured rail stresses between successive runs, but has little significance in determining the proper amount of reciprocating compensation.

Drawbar Pull

The variation of the drawbar pull throughout the driver revolution showed interesting changes between the different test series. It is significant to note that the maximum measured drawbar pull lagged the maximum calculated forward force. For the Soo Line locomotive tests, the maximum drawbar pull did not increase as the reciprocating unbalance was increased. For the Santa Fe engine tests, the maximum drawbar pull showed somewhat more than a proportionate increase as the reciprocating unbalance was increased, corresponding approximately in amount with the calculated forward force. The variation in drawbar pull is quite large during a driving-wheel revolution. The measurements indicate that an increase in reciprocating unbalance increases the magnitude of this variation, but that this increase can be offset to a large extent by the design of the buffer between the locomotive and tender and also the draft gear on the tender. Therefore, the amount of reciprocating unbalance need have little influence on the shuttling of the train.

Reciprocating Unbalance

A primary purpose of the tests was to determine the proper amount of reciprocating compensation, and the various test series with the three locomotives included reciprocating compensation within a range of 56 per cent to 0. Since the extent of the disturbance of the locomotive depends upon its mass and the amount of frequency of the disturbing forces, a good yardstick to use is the amount of reciprocating unbalance per side per ton of locomotive weight in working order. The tests covered a range of reciprocating unbalance from 4.6 to 12.8 lb. per ton of locomotive weight.

The various test measurements with these three locomotives show that the disturbing effects upon the locomotive of the reciprocating unbalance were moderate when the reciprocating unbalance did not exceed 8 lb. per ton. In the judgment of the cab observers, little difference could be detected in the riding qualities for this or a less amount of reciprocating unbalance.

For the test series having larger amounts of reciprocating unbalance, the test measurements show higher disturbing effects particularly for the Santa Fe System locomotive for which locomotive the rear vertical accelerations were excessively high with 9.1 and 10.9 lb. per ton of reciprocating unbalance. In the judgment of the cab observers the Illinois Central locomotive was rough with a reciprocating unbalance of 10.4 lb. per ton; the Soo Line locomotive somewhat rough with 8.8 lb. per ton, rough with 9.9 lb. per ton, and unsatisfactory with 12.8 lb. per ton; the Santa Fe System locomotive rough with 9.1 lb. per ton and unsatisfactory with 10.9 lb. per ton.

Effect on the Track

The vertical forces exerted upon the track at high speed are influenced by the revolving unbalance, vertical component of the main-rod thrust, sprung and unsprung load, and various impact effects not related to the counterbalancing. The amount of the vertical force is indicated by the longitudinal bending stress along the center line of the base of the rail. By plotting the measured stresses for a number of test runs, the mean value of these stresses may properly be considered to average out the impact effects not related to counterbalancing and provide a basis for studying the effects of counterbalancing alone.

The measurements for all test locomotives show a remarkably close agreement in general with the calculated values. It is believed, therefore, that the theory for calculating the resultant disturbing forces may be used with full confidence.

The measured rail stresses obtained in the tests with the various amounts of

revolving unbalance in the driving wheels show a definite reduction in the dynamic augment effect as the revolving unbalance is reduced. For very low amounts of revolving unbalance, the dynamic augment is entirely negligible. As the revolving unbalance is increased, the dynamic augment effect becomes more and more pronounced until a very decided vertical oscillation of the driving wheel is produced.

Lateral Forces on the Track

The lateral forces on the track were determined by means of special roller-bearing tie plates. For all test locomotives, there was little relation shown between the lateral forces and the amount of reciprocating unbalance. The main driver alone showed a well-defined relation of lateral force to pin position. This lateral force is closely related to simultaneous values of the vertical component of the thrust in both main rods and the couple produced by these components tending to rotate the main axle in a vertical transverse plane. The lateral forces on the tracks as well as the lateral accelerations of the locomotive are evidently a minor consideration in determining the best counterbalancing of the locomotive.

The leading and trailing wheels of all three locomotives showed a quite definite general tendency to bear to the left.

Distribution of Reciprocating Compensation

The measured rail stresses indicating the vertical forces exerted upon the track are helpful in determining how best to distribute the reciprocating compensation among the driving wheels. As the overbalance is decreased, the measured rail stresses show an increase in the amount of scatter. Apparently, the periodic disturbing force from the overbalance tends to break up random impacts not associated with counterbalancing. In the tests there was found to be little advantage in placing less than 100 lb. overbalance in any driving wheel. As the overbalance increased over this amount, the dynamic augment effect increased, but was not judged to be excessive up to an overbalance of 200 lb.

The main driving wheel is subject to the two-cycle-per-revolution vertical component of the main-rod thrust in addition to the one-cycle-per-revolution variation due to the overbalance. The effect of this is definitely shown in the measured rail stresses. From the standpoint of rail stresses, the tests indicated that it might be advisable to place 50 lb. less overbalance in the main driving wheels than in the coupled wheels to compensate for this effect.

Balancing for the out-of-plane or nosing effect of the reciprocating weight does not appear desirable. The tests have shown that this has little effect on the lateral accelerations of the locomotive. The vertical component of the main-rod thrust has a two-cycle-per-revolution variation and it is impossible to balance either it or its out-of-plane effect with a balance weight or weights in the driving wheel. Consequently, balancing the out-of-plane effect of the reciprocating weight would be at the expense of the more important fore-and-aft balancing for a given limitation on the overbalance.

Method of Balancing

The close agreement of the measured rail stresses with those calculated from the vertical forces determined by analytical treatment serves to verify the accuracy of this treatment. The calculations for the balancing of the main drivers, therefore, should be carried out on that basis.

In balancing the coupled drivers, the only advantage in balancing for the out-of-plane effect of the revolving weights would be to provide more balancing to oppose the nosing effect of the reciprocating weight. Since the tests have shown this to be of relative unimportance, there is no advantage in going to this refinement for balancing the front and rear drivers. For the 4-8-2 type locomotive tested there would be some advantage in balancing the intermediate drivers for the out-of-plane effect if it is greater than 25 per cent of the desired reciprocating compensation. This will tend to keep the dynamic augment effects from each wheel on one side of the locomotive in unison, which is somewhat beneficial from the standpoint of rail stresses.

Regardless of the method of balancing used, the resultant revolving unbalance should be determined for each wheel by the committee method.

Conclusions

High-speed operation of both passenger and freight locomotives requires further refinements in the counterbalancing of locomotives than has been the general practice in the past. The refinements considered necessary are:

a—Determine the rotating equivalent of the main rod by the pendulum or center of percussion method and balance this weight on the main pin instead of the full back end scale weight of the main rod.

b—Consider the center of gravity of the eccentric crank to determine its dynamic component forces acting parallel and perpendicular to the crank-pin diameter.

c—Take into account the eccentric-rod equivalent acting at the small end of the eccentric crank.

d—Transfer the revolving weights into two equivalent revolving unbalance components—one parallel with and the other 90 deg. to the crank-pin diameter in the counterweight plane of both right and left main drivers.

e—Provide sufficient counterweight in both right and left main drivers to offset exactly these components and add the desired amount of reciprocating compensation in each wheel.

Amount of Reciprocating Compensation

The test results have definitely shown that within the limits of 56 per cent to zero reciprocating compensation, that is, from 4.6 to 12.8 lb. per ton reciprocating unbalance, the disturbing effects on the locomotive are somewhat increased as the reciprocating compensation is reduced. These disturbing effects were judged to be undesirably high when the reciprocating unbalance was more than 8 lb. per side per ton of total locomotive weight in working order.

The test results have also shown that an overbalance of 100 lb. per wheel for all drivers shows a very low dynamic augment effect on the track and little advantage of a smaller unbalance is indicated. The dynamic augment effect increases as the over-balance is increased, but was not judged to be excessively high up to 200 lb. overbalance per wheel. Beyond 200 lb. the dynamic augment effect on the track became undesirably high.

Because of the added disturbing effect of the vertical component of the main-rod thrust, some advantage may be obtained by placing 50 lb. less over-balance in the main driving wheels than in the coupled wheels.

By the use of lightweight reciprocating parts in the construction of new locomotives or modification of existing locomotives, it will be possible to stay well within both of these limits and provide a balancing which will give very favorable effects on both locomotive and track, in so far as the disturbing forces from the reciprocating weight and dynamic augment are concerned, up to operating speeds equal to 1.5 times diameter speed. For locomotives having small diameter driving wheels, the use of lightweight side and main rods, in addition, may make it possible to provide the desired balancing of the main drivers.

The tests have definitely indicated that the characteristics of the engine and particularly the trailing trucks and of the drawbar and buffer between the locomotive and tender have a very important influence on the riding qualities and vertical and lateral accelerations of the locomotive at high speed.

A Summary of the Operation of Three Locomotives in the Counterbalance Tests

Road	Loco. No.	Type of loco.	Fuel	Range of outside temp., deg. F.	No. of test series	No. of tests run	No. of cars in train	Tonnage of train	Test train road mileage
Illinois Central	2400	4-8-2	Coal (stoker)	30-84	4	171	5	265	1,885
Minneapolis, St. Paul & Sault Ste. Marie	729	4-6-2	Coal (hand)	54-92	6	176	3	234	2,369
Atchison, Topeka & Santa Fe	3457	4-6-4	Oil	57-95	6	148	5	374	2,073
Totals					16	495			6,327

Supreme Court Takes Georgia Rate Case

Termed by the Chief Justice a "political issue," the state wins a 5-to-4 decision allowing it to sue for an injunction against railroads "conspiring" to fix "discriminatory" rates

WASHINGTON, D. C.

GOVERNOR ARNALL of Georgia and the Department of Justice won the first round in their campaign to have the nation's railroads enjoined from "conspiring" to fix freight rates when the Supreme Court of the United States, in a five-to-four decision, on March 26 assumed original jurisdiction in *State of Georgia* vs. *Pennsylvania Railroad* and granted the state the right to file its bill of complaint alleging violation of the federal anti-trust laws.

If precedent is followed in this case, trial will be ordered before a master appointed by the Supreme Court, who would hear testimony, receive evidence and make recommendations to the court, which then would review the evidence, consider the arguments, and render its decision, so that no early opinion as to the merits of the state's allegations is to be expected. Meanwhile, as noted by Chief Justice Stone in his dissenting opinion, the Interstate Commerce Commission has pending its decision in No. 28300, in which Georgia and other southern states have appeared in support of the contention that class rates prevailing in that territory are unlawful in that they are not "uniform" with Official Territory rates.

As noted in *Railway Age* of January 6, page 124, and as summed up by Justice Douglas in the majority opinion of the court, the essence of Georgia's complaint is a charge of conspiracy on the part of 20 railroads in restraint of interstate trade and commerce. The state "alleges that they have fixed arbitrary and noncompetitive rates and charges for transportation of freight by railroad to and from Georgia so as to prefer the ports of other states over the ports of Georgia. It charges that some 60 rate bureaus, committees, conferences, associations and other private rate-fixing agencies have been utilized by the defendants to fix these rates; that no road can change joint through rates without the approval of these private agencies; that this private rate-fixing machinery which is not sanctioned by the Interstate Commerce Act and which is prohibited by the anti-trust acts has put the effective control of rates to and from Georgia in the hands of the defendants.

Southern Roads "Coerced"

"The complaint alleges," Justice Douglas explained further, "that these practices in purpose and effect give manufacturers, sellers and other shippers in the North an advantage over manufacturers, shippers and others in Georgia. It alleges that the rates so fixed are approximately 39 per cent higher than the rates and charges for transportation of like commodities for like distances between points in the North. It alleges that the defendants who have lines wholly or principally in the South are generally dominated and coerced by the defendants who have northern roads and therefore that even when the southern defendants desire, they cannot publish joint through rates between Georgia and the North when the Northern carriers refuse to join in such rates."

These allegations Georgia will be given an opportunity to try to prove when the case is presented. The state has asked injunctive relief from the alleged conspiracies on the ground that the effect of the "discriminations" has been that many of its products are denied equal access to national markets with those of other states; that the state's economy has been limited largely to agricultural production, its development of manufactures and of its natural wealth being restricted; that the state's efforts to encourage the development of industry and promote the welfare of its people have been frustrated; and that Georgia's economy has been held in a "state of arrested development."

Defendant Railroads

The 20 defendant railroads, in addition to the Pennsylvania, are the Atlantic Coast Line; Carolina, Clinchfield & Ohio; Louisville & Nashville; Nashville, Chattanooga & St. Louis; Seaboard Air Line; Gulf, Mobile & Ohio; Illinois Central; Southern; Chesapeake & Ohio; New York, Chicago & St. Louis; Baltimore & Ohio; Chicago & Eastern Illinois; Western Maryland; Erie; Richmond, Fredericksburg & Potomac; Chicago, Indianapolis & Louisville; New York Central; Wabash; and Norfolk & Western. It was asserted by the railroads, however, and not disputed, that two of these roads, that is, the Seaboard and the N. C. & St. L., are "citizens" of Georgia and therefore must be excluded from an original Supreme Court proceeding, and it was intimated that such action might be taken.

The court's majority took the position that the suit to be tried is "to dissolve an illegal combination or to confine it to the legitimate area of collaboration. That relief cannot be obtained from the [Interstate Commerce] Commission for it has no supervisory authority over the combination. . . . If the rate-making function is freed from the unlawful restraints of the alleged conspiracy, the rates of the future will then be fixed in the manner envisioned by Congress." Justice Douglas was joined in this view by Justices Black, Murphy, Reed and Rutledge.

"Futility" of an Injunction

The minority opinion, expressed by the Chief Justice and agreed to by Justices Roberts, Frankfurter and Jackson, was that the majority's decision that the court "can find a way to enjoin the alleged conspiracy to fix rates, without regard to what rates are or may be agreed upon and whether the commission finds them to be lawful or unlawful, is an invitation to a course of the veriest futility."

"If relief enjoining the conspiracy complained of were effective to relieve the state of the injury from unlawful rates to which it objects," said the Chief Justice further, "the decree must result in a new rate structure applicable to the railroads which are parties defendant. Prejudice and discrimination would be created as to every other state in southern territory and as to shippers and consignees of freight in those states who would still be governed by the published tariff rates, against which only Georgia and its citizens would have secured some measure of relief. There would be two sets of rates between the South and the North, one, effected as a result of this court's decree, applicable to shippers in Georgia over the railroads which are defendants here, and another governed by published tariffs approved by the commission and applicable to all other shippers and railroads in the South.

"Since illegality in existing rates is averred because of disparity in the level of rates in two rate-making areas, with no allegation that southern carriers receive more than a fair charge for their transportation service, the court would be required to determine whether the discrimination should be removed by increasing rates in Official Territory or establishing an intermediate level of new rates—a determination which could be arrived at only by the performance by this court of the legislative function of rate making which has hitherto been reserved to the commission.

"If all this is to be avoided by the injunction against the alleged conspiracy, but without enjoining any of its asserted evil consequences in rate making, the issue originally tendered would, by the amendment to the bill of complaint," Chief Justice Stone observed, "seem to

amount to little if anything more than a political issue."

The majority was not persuaded by this argument, but took the position that Georgia does not seek to have the court act in place of the commission. "It seeks to remove from the field of rate-making the influences of a combination which exceeds the limits of the collaboration authorized for the fixing of joint through rates. It seeks to put an end to discriminatory and coercive practices. The aim is to make it possible for individual carriers to perform their duty under the act, so that whatever tariffs may be continued in effect or superseded by new ones may be tariffs which are free from the restrictive, discriminatory, and coercive influences of the combination. That is not to undercut or impair the primary jurisdiction of the commission over rates. It is to free the rate-making function of the influences of a conspiracy over which the commission has no authority but which if proven to exist can only hinder the commission in the tasks with which it is confronted."

In its construction of the complaint which the state is permitted to file, the majority, said Justice Douglas, has looked upon it "with that liberality accorded the complaint of a sovereign state as presenting a substantial question with sufficient clarity and specificity as to require a joinder of issues." The complaint may have to be "exemplified and clarified," he remarked, as respects its charges of coercion and discrimination, its claims of damage suffered, or otherwise.

The Defendants' Arguments

The railroads, as Justice Douglas pointed out, had argued that the state's motion should be denied because (1) the complaint presents no justiciable controversy; (2) it fails to state a cause of action; and (3) two of the defendant railroads are "citizens of Georgia."

Taking up these arguments in order, the majority held that Georgia does present a claim upon which the court can act, appearing both as *parens patriae*, that is, the protector of its people, and in its own right as a shipper and consignee. Suing for her own injuries, Georgia is a "person" within the meaning of section 16 of the Clayton Anti-trust Act, it found, and therefore is authorized to maintain suits to restrain violations of that law or to recover damages resulting from such violations. Further, it found, the state has a right to sue, under federal laws, as *parens patriae* because its economy allegedly has been injured by a "price-fixing scheme" of a "conspiracy of private persons." While the enforcement of the criminal sanctions of the anti-trust laws is exclusively in the province of the federal government, Congress followed a different course as to civil sanctions, Justice Douglas observed, authorizing civil suits not only by the federal government but by "other persons."

Turning to the second legal issue raised, whether Georgia had presented a cause of action for which a court of equity can give effective relief, the majority noted five arguments in opposition to the state's position; (1) Under the so-called *Abilene* decision (*Texas & Pacific* vs. *Abilene Cotton Oil Co.*, 204 U. S. 426) no court action for damages on account of unlawful rates may be maintained without prior resort to the I. C. C.; (2) a judicial determination of the legality of a rate can be obtained only through review of a commission order, and an injunction to restrain allegedly unlawful rates may not be granted in advance of determination of the question by the commission; (3) under the *Keogh* decision (*Keogh* vs. *Chicago & North Western*, 260 U. S. 156), damages under the anti-trust laws may not be recovered from railroads even though rates approved by the I. C. C. were fixed pursuant to a conspiracy; (4) section 16 of the Clayton Act bars persons other than the United States from enjoining anti-trust law violations; and (5) Georgia cannot sue on common law grounds based on a rate-fixing conspiracy.

Can't Collect Damages

The majority conceded the validity of the third argument, and found that the *Keogh* decision barred Georgia from recovering damages from the railroads, even though an unlawful conspiracy should be shown to exist. Recovery of damages being barred, the *Abilene* case principle was not involved. As to the second argument, the majority again agreed that the precedents cited in its support established that Congress had provided a method of obtaining relief from an order of the commission which is exclusive of all other remedies, including a state's suit in the Supreme Court. But, Justice Douglas went on, "the relief which Georgia seeks is not a matter subject to the jurisdiction of the commission. Georgia in this proceeding is not seeking an injunction against the continuance of any tariff; nor does she seek to have any tariff provision canceled. She merely asks that the alleged rate-fixing combination and conspiracy among the defendant carriers be enjoined. . . . That is a matter over which the commission has no jurisdiction." The majority view with respect to section 16 of the Clayton Act has already been noted. Having found therein a basis for the state to sue as a "person" for injunctive relief from damage resulting from violation of the anti-trust laws, it proceeded, as the Chief Justice put it, to disregard the "fainthearted and unconvincing assertion of the state that it has a 'common law' cause of action."

Taking up the "involved" question whether two of the defendant railroads are "citizens" of Georgia, which the state denied, the majority found that it did not have to decide that question at this stage of the proceeding. The two roads, Justice Douglas said, "are not indispensable parties. In a suit to enjoin a conspiracy not all the conspirators are necessary parties defendant. It is averred and not challenged that the other defendants are citizens of other states. The citizenship of the two defendants in question may be challenged by a motion to strike. But if they are stricken, the court would not lose original jurisdiction over the controversy between Georgia and the other defendants."

Takes Original Jurisdiction

Having thus found that Georgia could properly seek judicial relief from the alleged conspiracy, rather than resort to the commission, the majority proceeded to deal with the question of original jurisdiction, that being the ground on which the state had sought to have the issue resolved directly by the Supreme Court, rather than having it reach that court on appeal from a lower court. Dismissing the state's claim of injury as a proprietor of a railroad, and of various institutions, as a "make-weight," and granting its right to sue as a result of its presence as *parens patriae* on behalf of its citizens, the majority took the position that it could take jurisdiction under the provisions of clauses 1 and 2 of section 2, article III of the Constitution. "There is some suggestion that the issues tendered by the bill of complaint present questions which a district court is quite competent to decide," remarked Justice Douglas. "The suggestion is that we deny the motion for leave to file, without prejudice to the maintenance of the suit in an appropriate district court."

The difficulty is, he continued, that while the Clayton Act provides that any action against a corporation under the anti-trust laws may be brought in the judicial district where it is an "inhabitant" or where it transacts business, Georgia's bill of complaint alleges that the defendants are not citizens of Georgia or within the jurisdiction of Georgia courts. This contention, he pointed out, was disputed with respect to two of the defendants, but not otherwise. Unless it were clear that all of the defendants could be found in some "convenient forum" Georgia could not be said to have a "proper and adequate remedy" apart from the jurisdiction of the Supreme Court, and "no such showing has been made," in the majority's opinion.

A Mighty Instrument

"The original jurisdiction of this court is one of the mighty instruments which the framers of the Constitution provided so that adequate machinery might be available for the peaceful settlement of disputes between states and between a state and citizens of another state," the majority asserted, and having developed the view that no showing had been made that a district court would have full jurisdiction, it arrived at the conclusion that "once a state makes out a case which comes within our original jurisdiction, its right to come here is established. There is no requirement in the Constitution that it go further and

show that no other forum is available to it."

District Courts Available

The Chief Justice did not agree with this view, however. "This puts the shoe on the wrong foot," he declared. "When the question of our discretionary power to remit the parties to an adequate remedy in some other court is raised," he went on to say, "it is incumbent upon it to show that it will be unable to reach all the defendants in a convenient district. And Georgia, although invited on the argument of this motion to do so, has made no showing that the suit cannot be proceeded with in a district court as readily as in this court. . . . We can only conclude that there is no such obstacle."

Thus did the Chief Justice develop the first of the three reasons why he and the other dissenters held that the state's motion should have been denied by the Supreme Court. These reasons he stated as follows: (1) Because in its judicial discretion, this court should, without deciding the merits, leave the state to its remedy, if any, in the district court; (2) because the state lacks standing to present the only substantial issue in the case; and (3) because in the present posture of the case, the bill of complaint, for several reasons, fails to state a cause of action for which a court of equity can give effective relief.

Precedent Discarded

The majority having assumed jurisdiction, the second of the minority's reasons for denial required discussion, the Chief Justice continued. "The gist of the cause of action asserted by the amended complaint is the injury visited upon the inhabitants of the state of Georgia by the alleged conspiracy," he observed. "But the inhabitants of the state who have suffered injury or who are threatened with injury by the unlawful practices alleged . . . are alone entitled to seek a legal remedy for their injury, and are the proper parties plaintiff in any suit to enforce their right. . . . It has long been settled by the decisions of this court that a state is without standing to maintain suit for injuries sustained by its citizens and inhabitants for which they may sue in their own behalf, and many years ago it was established by decisions of this court, whose authority has remained unimpaired until discarded by the [majority] . . . that a state does not stand in such relation to its citizens and inhabitants as to enable it to maintain an original suit in this court to protect them by injunction from injuries to the state's economy resulting from the maintenance of unlawful interstate freight rates." Among other precedents, the Chief Justice here cited the so-called *Atchison Railway* case (*Oklahoma* vs. *A. T. & S. F. Ry.*, 220 U. S. 277).

Taking further issue with the majority, the dissenting opinion asserted that "the federal government is *parens patriae* with respect of the cause of action here alleged, and not the state. The federal government alone stands in such relationship to the citizens and inhabitants of the United States, as to permit the bringing of suit in their behalf, to protect them from the violation of federal laws relating to interstate commerce."

Even if Georgia has standing to maintain the suit, and the court should entertain original jurisdiction, the Chief Justice continued, the "more important" question remains—whether a court of equity can give any effective relief in the circumstances. "Unless Georgia can show that the present rates are unlawful, or that some other rate structure, which could be substituted for that now in force, would be just and reasonable, which Georgia cannot do without prior resort to the commission, it can not show that any other structure could lawfully exist or that any injury to it is threatened by the conspiracy.

The Dissent Summed Up

"It follows from this," the dissent argued, "that the prerequisites to the maintenance of the present suit are lacking for the following reasons: First, the state has not availed itself of or exhausted the administrative remedies provided by the Interstate Commerce Act, which may afford an adequate remedy and which must in any case precede the institution of the present suit in equity. Second, the suit as now framed falls within the proviso of section 16 of the Clayton Act denying to any 'person', except the United States, authority to bring suit in equity for injunctive relief against any common carrier subject 'to the provisions of' the Interstate Commerce Act, 'in respect of any matter subject to the regulation, supervision, or other jurisdiction of the Interstate Commerce Commission.' And third, in the absence of a determination by the commission of the unlawfulness of the interstate freight tariffs filed or proposed to be filed by the several defendant carriers, no court of equity could, within the scope of its authority, frame a decree effectively enjoining an agreement or 'conspiracy' to file tariffs establishing interstate freight rates."

Chaos Would Result

After enlarging upon this line of argument, the Chief Justice concluded with the observation that the reasoning of the majority "is not and cannot be restricted to this case. If Georgia may prosecute the present suit, every shipper or consignee of freight who asserts injury by a conspiracy respecting railroad rates in violation of the anti-trust laws may maintain a like suit in a district court. The prosecution of such suits cannot but fail to bring chaos into the field of interstate rate making. The entry of decrees for the plaintiffs could only mean the breakdown of the unified system of fixing rates by commission action, which Congress has ordained by the Interstate Commerce Act. It was the purpose of section 16 of the Clayton Act to preclude such a breakdown. Its purpose can and should be effected by the refusal of this court to entertain the proposed suit."

The majority, however, took the view that "dissolution of illegal combinations or a restriction of their conduct to lawful channels is a conventional form of relief accorded in anti-trust suits. No more is envisaged here. If the alleged combination is shown to exist, the decree which can be entered will be no idle or futile gesture. It will restore that degree of competition envisaged by Congress when it enacted the Interstate Commerce Act. . . . The threatened injury is clear. The damage alleged is sufficient to satisfy the preliminary requirements of this motion to file. There is no administrative control over the combination. And no adequate or effective remedy other than this suit is suggested which Georgia can employ to eliminate from rate-making the influences of the unlawful conspiracy alleged to exist here."

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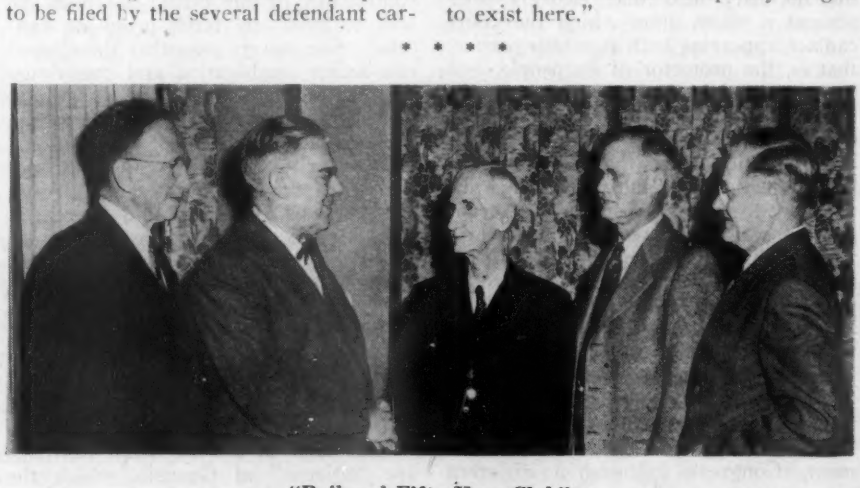


"Railroad Fifty-Year Club"

Thought to be the only organization of its kind in the country, this club was established in Los Angeles, in March, by five veteran railroaders, who, as a quintet, average 53 years of railroad service. (From left to right): John Atkinson, of the S. P. passenger department (nearly 51 years); Fred Webb, Pennsylvania passenger department (50 years); T. W. Pate, now retired from the Santa Fe (57 years); Frank Ramsey, Union Pacific streamliner conductor (52 years); and, C. L. Wrenn, traveling passenger agent for the U. P. (56 years)

Electrification of the C. N. R. Terminal

Sealed-off, glass-bulb, mercury-arc rectifiers supply 2400-volt power for electric traction — overhead completed with scrap steel and wood

By R. G. GAGE
Chief Electrical Engineer
Canadian National Railways

THE development of the Montreal terminal of the Canadian National Railways, which was started in 1931 and lay dormant all during the depression years, was revived as an unemployment relief measure and continued as a wartime measure in 1939. The project consisted of centralizing the four passenger stations, the construction of a new station, and the alteration of existing freight yards and facilities.

The Canadian National Railways' facilities at Montreal are a combination of those of the Grand Trunk Railway and Canadian Northern Railway, both of which, together with the Canadian Government Railways, were combined to form the Canadian National Railways System in Canada. The use of Bonaventure station, the old and outmoded terminal of the Grand Trunk Railway and Canadian Government Railways, for many years had been the cause of congestion and, owing to the numerous grade crossings of city streets involved, has been a source of serious city complaints.

During its construction the only way the Canadian National could enter Montreal for its eastern terminus was by way of a three-mile double-track tunnel under Mount Royal, terminating in a passenger station at Lagauchetiere street, adjacent to the uptown retail business district of the city. Having to operate through this long tunnel, the Canadian Northern was forced to electrify its lines for a distance of about ten miles, including the tunnel, and one of the then (1914) modern and popular systems, namely 2,400-volt d.c., was adopted. Six 1,000-hp. locomotive units were built by the General Electric and the Canadian General Electric companies and eight multiple-unit car equipments were provided, two more of which were subsequently installed.

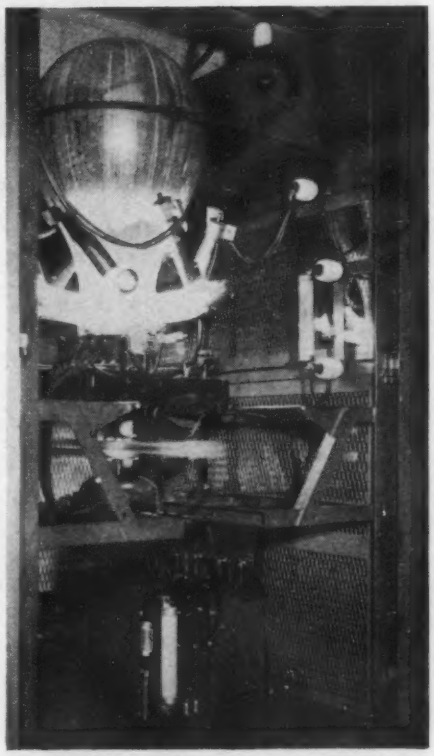
Power Supply

Power for the Montreal terminal is purchased from the Quebec Hydro Commission at three-phase, 12,000 volts, being received from two independent substations which, together with six other substations, are connected to the 66,000-volt ring of the power distributing system.

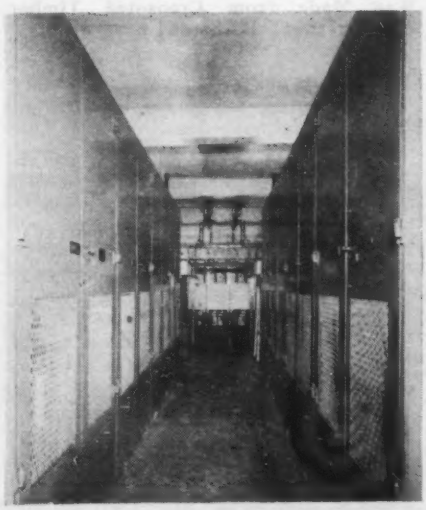
The two supply lines terminate in a railway transformer substation, located below the tracks in the station area, each line having capacity to carry the total terminal load of approximately 6,000 kva. The main circuit breakers on each of these supply cables are equipped with an automatic change-over device ensuring the continuity of service in case of trouble arising in the cable itself or in the substation feeding it.

This 12,000-volt supply is stepped down to 4,000 volts, three-phase for general distributions; 208/120 volts, three-phase, four-wire for general lighting and car charging purposes; and 575 volts, three-phase for station elevators, fan motors, pumps, etc. Two independent three-phase, 4,000-volt circuits are run in conduit from this substation to the central control tower at the Lachine Canal lift bridge to supply energy for the operation of the lift bridge over the canal and for the terminal signaling.

The feature of the power system for the terminal which is of special interest is the use of glass-bulb mercury-arc rectifiers for supplying the 2,400-volt direct current for traction. Although these are used to a considerable extent for traction purposes in England and in other parts of the Commonwealth, it is their first use in Canada and probably any place in 2,400-volt service.



Interior of Rectifier Cubicle



Rectifier Station Showing the Two Banks of Rectifiers, One on Each Side of the Center Aisle, with Three of the Trolley Section Breakers in the Far End

Glass-Bulb Rectifiers

Two independent 12,000-volt three-phase circuits are run from the transformer station and, protected by main circuit breakers connected with two 2,156-kva., 12,000/2,200-volt, 3- to 12-phase rectifier transformers. Each transformer feeds a bank of four glass-bulb rectifiers whose capacity under normal rating is 1,500 kw. per bank and 3,000 kw. on a five-minute peak rating. The 12 phases in each transformer are connected in two three-phase groups joined at their neutral points by an interphase transformer; these two six-phase groups are in turn connected together at their neutral points by a third interphase transformer. The rectifiers are operated in pairs connected in parallel across six phases. Each bank is protected by a 2,400-volt d.c. breaker with a normal time lag set to take care of the normal operating short-period peak loads but with a very high-speed setting for reverse current, protecting against reverse flow between banks in case of a backfire in the bulb.

The chief reasons for the selection of glass-bulb rectifiers instead of the more familiar steel-tank type were the decidedly lower cost to install; a much better delivery date under wartime conditions; the advantage of having the installed capacity in eight equal units instead of two; the elimination of all vacuum and cooling auxiliaries; and the

This article is an abstract of a paper presented to the American Institute of Electrical Engineers in New York on January 25. A general description of the Canadian National's Montreal Terminal was published in the *Railway Age* of July 31, and August 7, 1943.

excellent reported record in service on British railways.

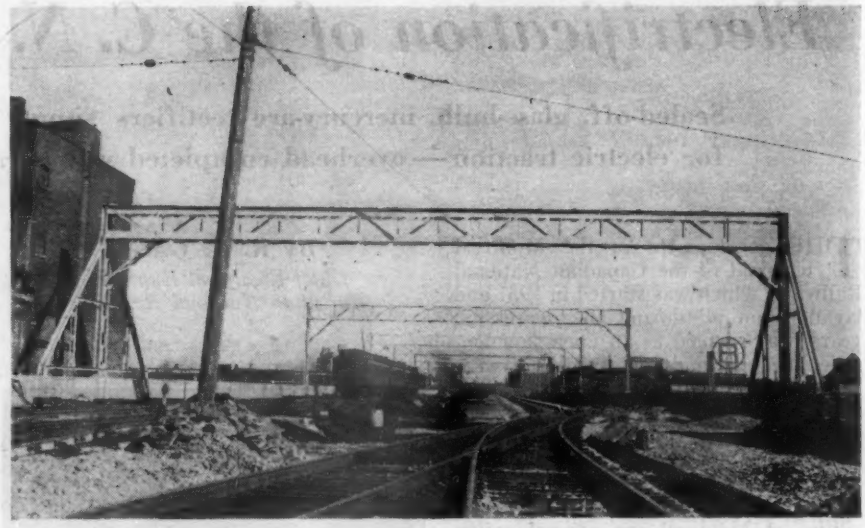
The rectifiers consist of vacuum-sealed glass bulbs fitted with six operating anodes, each protected with a fuse, two exciting anodes, and an auxiliary automatic-starting anode. A pool of mercury covers the cathode located in the base of the bulb. The bulbs are mounted in steel cabinets with open grille doors for purposes of ventilation and are cooled by a fan located immediately beneath the bulb and connected so that its speed increases with the total current in the rectifier. The life of the tubes, as indicated by the records in other railway installations, is a matter of years. Individual failures, of course, occur as a result of defective workmanship or material as in all types of equipment.

The rectifier is started by energizing the 120-volt auxiliary circuit, which operates a magnetic contactor whose function is to cause a flexible contact to dip into the mercury pool and, when withdrawn, to strike an arc. This arc energizes the exciting circuit and maintains continuous arcing on the exciter electrodes which in turn is automatically transferred to the load shocks upon the application of load. Inasmuch as the rectifier has a permanent vacuum, no preliminary time is required for auxiliaries and the rectifier can take on its load immediately upon demand. It can therefore be thrown on or off the line from remote control points, or could be controlled by a time switch if desired. By the use of a large number of anodes in multiple, 24 in this case, and the reduction of current concentration on the anodes, backfiring is eliminated, or at least none has taken place to date.

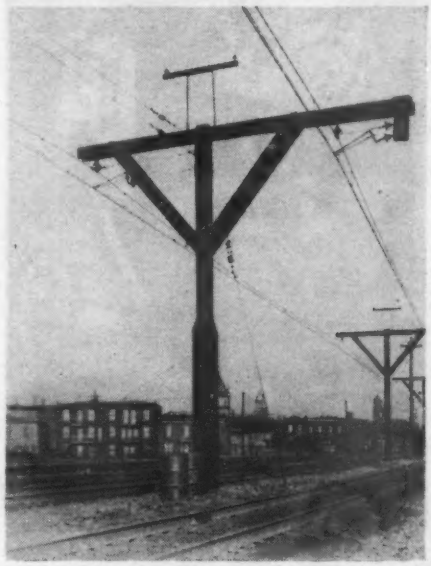
Rectifier Station

The transformers are of the oil-insulated self-cooled type, 3-to-12 phase, housing the interphase transformers, the auxiliary starting transformer, and a choke in the main rectifier circuit which controls the cooling-fan speed in proportion to the lead.

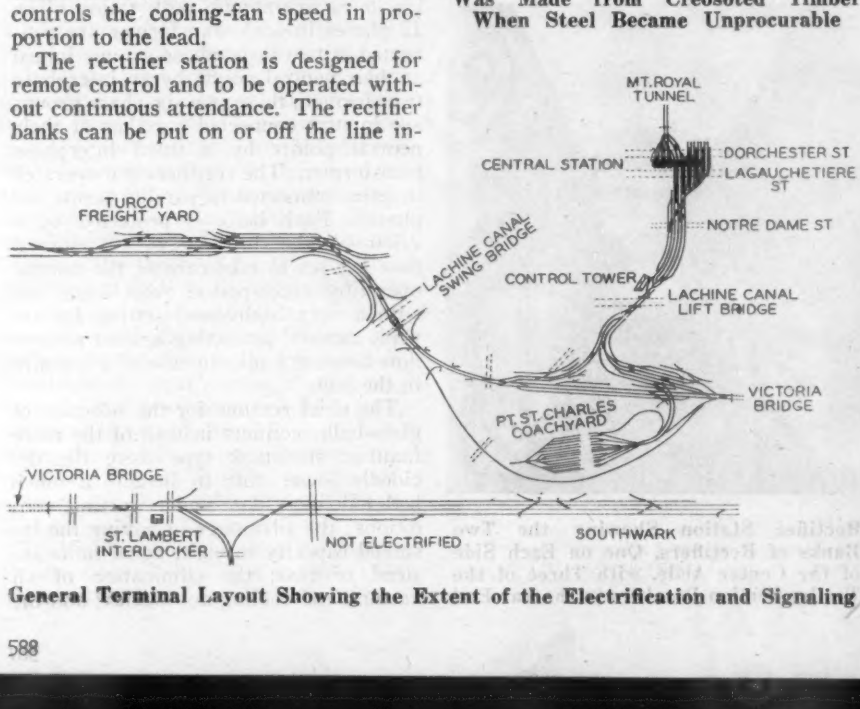
The rectifier station is designed for remote control and to be operated without continuous attendance. The rectifier banks can be put on or off the line independently from manually operated remote-control points from the substation or at the interlocking control tower at the Lachine Canal.



Catenary Bridge Fabricated from New Material



One of the Supporting Structures Which Was Made from Creosoted Timber When Steel Became Unprocurable



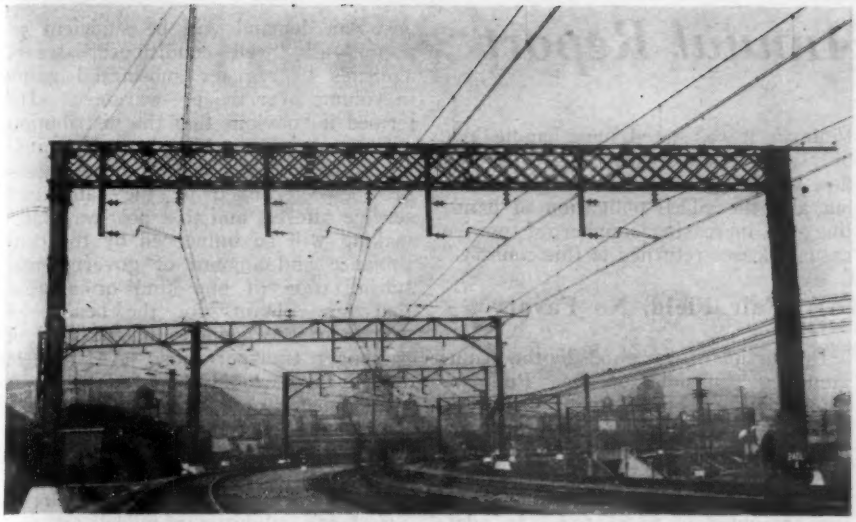
General Terminal Layout Showing the Extent of the Electrification and Signaling

In order to overcome interference with telegraph and telephone communications, corrective equipment was installed consisting of a coil of 30 turns and 1.115 millihenries inductance in the negative return and four tuned shunts between the positive and negative to eliminate the 360, 720, 1,080, and 1,440 frequencies. The rectifiers are operated without interference with existing communication circuits.

Catenary System

In addition to the mercury-arc rectifier station, direct current is supplied from a motor generator substation orginally installed by the Canadian Northern Railway in 1918. This station consists of two three-unit sets composed of a 12-000-volt synchronous motor and two 1,200-volt, 1,500 kw. d.c. generators connected in series. This station is being held as a reserve and will undoubtedly be replaced by modern rectifiers when the electrification is extended.

The catenary system throughout the terminal consists of steel bridges spanning the main line tracks spaced on an average of 180 feet apart, carrying copper conductors of approximately 800,000 circular mils equivalent copper conductivity per track, made up of a Copperweld and copper main passenger, copper auxiliary messenger, and two bronze grooved trolley wires. The trolley system is divided into 12 sections, each provided with a feeder breaker. Seven of these breakers, with an auxiliary for emergency use, are installed in the rectifier substation, and the balance in the switching room of the interlocking tower at the canal. All the breakers are remotely controlled by push-button switches mounted on the signal control panel in the operating tower. The signal levermen, under the direction of the train controller, are thus able to ener-



Catenary Structure Made of Second-Hand Steel Removed from Railway Bridges

gize or de-energize any trolley section as called for by the exigencies of the service. They also control the rectifier station, putting either or both banks on or off the line as required.

There are no special engineering features in the overhead system. It conforms to recognized good practices for heavy-duty electrification. Owing to the steel shortage under war conditions, the catenary bridges are lacking in uniformity. At first they were designed and fabricated from new material, then from second-hand bridge steel removed from railway bridges and finally, from creosoted timber when steel became unprocurable.

Harbour Installation

The additional electric locomotives necessary for an enlarged electrical operation, together with the feeder breakers for the 12 trolley sections, were obtained from the Montreal Harbour Commission as a result of their termination of electrical operation. The electrical characteristics of the Harbour installation were by design the same as those of the original Canadian Northern installation, so that it would be possible for the Canadian Northern to operate on the Harbour trackage in the interchange service.

Throughout the electrified zone, one rail of each track is bonded for propulsion return currents and the several return rails in parallel tracks are cross-bonded together for conductivity. Owing to the use of direct current for propulsion, it was necessary to install a.c. signal track circuits. Complications in the layout in some of the tracks, as well as their cost, made it desirable to avoid the use of impedance bonds as frequently used with signal systems on electrified lines. This bonded return rail is used as a common rail for both signaling and traction, the other rail being insulated and retained for signaling.

A new coachyard was built at Point St. Charles consisting of 32 tracks, 19 of which were electrified, lighted, and equipped with battery-charging, vacuum, and steam-heating facilities. The overhead consists of the lightest type of street-railway construction with the trolley carried from single cross-messengers spaced at 80-foot centers. Thirty-three-foot 85-pound scrap rails, with the ends embedded about five feet in concrete, are used as the trolley supports. The stresses in the trolley wires, as well as in the cross spans, are taken care of by dead-end guying. On each alternate support in the longitudinal rows, and staggered as between rows, is mounted a 6,000-lumen 20-ampere series lamp for lighting the yard. The lamps are supported in a hoop-type bracket mounted on the top of the trolley supporting poles giving a height above rail of about 28 feet. The lamps are fitted with symmetric refractors and are arranged in four regulated circuits. Very satisfactory and uniform lighting throughout the yard area has been obtained.

Battery Charging

A rather novel feature in this yard is the arrangement of car-charging facilities. The constant-potential system is used, supplemented by engine-driven portable chargers to take care of the occasional car requiring special attention, such as those fitted with Edison batteries requiring a higher charging voltage.

Owing to the large variations in the total car-charging load, the usual practice of having two car-charging generator sets, with which at least one relatively large set would be running with a very light load for a considerable portion of the day, it was decided to install sixteen 500-ampere, 50-volt motor-generator sets located on the midway through the center of the platforms and at the approximate center of the loads. Owing to the relatively narrow platforms, these sets were mounted in small houses about 15 feet above the platforms, thus permitting the ordinary use of platform trucks necessary in the servicing of trains.

The houses, which also accommodate the regulating equipment, are accessible through a trap door in the floor. Windows provide ventilation in the summer and heat generated by the sets themselves provides the necessary heat in winter. The wiring for each platform is the three-wire return-loop system with the operating coils of the voltage regulator connected across, thus maintaining a constant potential at all charging outlets. Each generator is protected by a current regulator, a fuse, and a reverse-current relay. There is also a magnetic-starter with start-stop push-button control at the base of each house support. A series relay is connected to the d.c. side which serves to stop the set automatically when the last car is taken off charge. This relay also makes it necessary to have at least one car on the circuit before the motor-generator set will run. All of the above work was carried out by the chief engineer of the Canadian National Railways, under the immediate supervision of the chief electrical engineer and his staff.

(Electric locomotives and trolley feeder breakers were manufactured by the English Electric Company, London, England; glass-bulb rectifiers and rectifier transformer by the Hewittic Electric Company, Ltd., Hersham (Walton-on-Thames) Surrey, England; overhead trolley fittings by the Ohio Brass Company, Mansfield, Ohio. Signal equipment for the Montreal area was purchased from the Union Switch & Signal Company, Pittsburgh, Pa., and for the St. Lambert area from the General Railway Signal Company, Rochester, N. Y.—*Editor's Note.*)

* * *

Aboard a "40 and 8"

Members of an anti-tank company are photographed with their mascot near Lierneux, Belgium. (Begin at bottom) Sgt. Henry H. Prince, of Reading, Pa., holding dog; Pvt. William Roberts, Endicott, N. Y.; Pfc. Arthur G. Kellen, Lemars, Ia.; Pfc. Jim Summers, Tell City, Ind.; Pfc. Ovey Barnett, Little Rock, Ark.; Pfc. Orville Dalton, Marion, Ky.

Pullman, Inc., Annual Report

PULLMAN, Inc.'s, plan for the sale of its sleeping car properties to the railroads was described on March 21 in the company's annual report by David A, Crawford, president, as a means of helping the railroads to meet post-war travel competition. Mr. Crawford said that the proposal consolidates "in railroad ownership the now separate —and in part, at least—diverse interests of the railroads and of Pullman in the transportation and accommodation phases of the sleeping car and travel service, and would result in giving to that combined enterprise the benefit of an integrated handling of the vital rate-making function. It would also assure a continuity of operating opportunity that is a prerequisite for the large, long-term, new investment that can now be foreseen to be necessary to equip this service adequately to meet post-war competitive conditions."

Mr. Crawford reported to the stockholders consolidated net income, before renegotiation, of $12,890,006 for 1944, equal to $3.99 a share, as compared with adjusted consolidated net income in 1943 of $8,176,006, or $2.52 a share, after renegotiation. Total provision for taxes in 1944 amounted to $43,286,722, equal to $13.40 a share. Principal reason for the increase in net income, despite a decline in gross income from $415,713,933 in 1943 to $352,156,723 in 1944, was the return to 1944 carrier net earnings of $2,743,910 from the deferred maintenance reserve originally set up in 1942 out of tax-paid income. Reflecting principally the disbursement of $18,250,000 in cash in connection with acquisition of the M. W. Kellogg Company, working capital of the consolidated group (not including that held in the Kellogg Company treasury) declined $1,831,466 to a total of $96,864,911, as of December 31, 1944.

Troop Movement

In meeting the demand for long distance mass movement of troops, Pullman performed a total of 12,500,000,000 passenger-miles of service, which engaged throughout 1944 approximately one-half of the entire fleet of Pullman, Inc.'s, car operating subsidiary, the Pullman Company. Including individual military and civilian travel, Pullman serviced a total volume of 28,300,000,000 miles of passenger travel.

The sleeping and parlor car business accounted for $8,822,262 of the net income of Pullman, Inc., and for $165,692,598 of gross revenues. Total maintenance expenditures on Pullman equipment in 1944 mounted to $31,808,748 from $21,722,430 in 1943, and consequently, no additional amounts were added in 1944 to the reserve for deferred maintenance. The report warned civilians of "increasingly difficult travel conditions in 1945." The railroads and Pullman, it was stated, must handle "not only a probably westward shift in the flow of war-generated passenger traffic, but also the added obligation of handling the increasing number of service casualty cases returned to this country."

Fair Field, No Favor

Production of war goods by the manufacturing subsidiary, the Pullman-Standard Car Manufacturing Company, totaled $144,000,000 in 1944, thus accounting for more than three-quarters of the $185,347,804 of total sales and miscellaneous revenues, on which earning amounted to $3,637,685. In addition to producing landing ships and patrol escort vessels, the manufacturing division turned out wings and assemblies for Douglas transport planes, heavy-gun carriages, transport mounts, shells, bombs and trench mortars, and military railway cars.

Elaborating his views on the future of sleeping car service, Mr. Crawford told stockholders that "the railroad industry, including the attached Pullman sleeping car service, now has plans for developments which will make sleeper travel by rail more attractive than ever and help to maintain its advantages in cost, comfort, convenience, and—above all—safety." Describing Americans as being more travel-minded today than ever, he expressed the belief that the post-war demand will be sufficient to permit all "well conditioned" travel agencies to register substantial gains in volume over the pre-war level. He termed it "obvious that the distribution of patronage among the passenger transportation agencies will in large measure be determined by the rates and service offered, and that post-war rate-making will be influenced by the continuance and amount of governmental subsidization of one kind or another that now obtains for the benefit of certain of the agencies in the field of passenger transportation. A fair field and no favor would make for the greatest efficiency and improvement among the competitive services." Mr. Crawford reported widespread interest among the forward-looking buyers of railway passenger equipment in Pullman-Standard's exhibition of models and pictured designs of "tomorrow's trains," which has been shown in several railroad-headquarters cities. Relating this planning to post-war jobs, he said that if the railroads, using modern freight and passenger equipment, can successfully maintain their standing as the nation's leading mass transportation medium, there should be plenty of demand over a long period for the equipment products of Pullman-Standard and for the sleeping car service, no matter how or by whom the latter may be conducted.

On March 22, Pullman, Inc., secured what amounted to an extension of the court's order of May 8, 1944, requiring it to dispose of either its manufacturing

(*Continued on page 593*)

Traffic and Operating Statistics

Comparative Statement for Years Ended December 31

Item	1944	1943	1942	1941	1940
Cars Owned	8,336[7]	7,747[6]	7,121	7,048	6,901
Cars Operated	7,485	7,096	6,368	5,303	4,990
Car Miles	1,326,580,210	1,222,676,452	1,071,254,181	878,057,274	820,386,700
Revenue Passengers:					
Berth	29,299,136	26,561,931	21,008,309	13,166,554	11,077,546
Seat	6,538,772	6,069,968	5,054,240	3,744,167	3,687,770
Total	35,837,908	32,631,899	26,062,549	16,910,721	14,765,316
Revenue Passenger Miles	28,267,090,536	25,891,465,679	19,071,589,061	10,070,406,876	8,213,878,992
Operating Revenue[1]	$146,613,094	$124,960,365	$99,722,785	$67,040,587	$60,143,649
Average per Car Operated	19,587.59	17,609.97	15,659.99	12,642.01	12,052.84
Expenses[2]	137,790,832[4]	120,639,898	93,235,511[5]	65,307,638	57,899,790
Average per Car Operated	18,408.93	17,001.11	14,641.25	12,315.23	11,603.16
Net Carrier Earnings[3]	8,822,262	4,320,467	6,487,273	1,732,949	2,243,859
Traffic Averages:					
Average Operating Revenue per Passenger	4.09	3.83	3.83	3.96	4.07
Average Net Carrier Earning per Passenger	0.25	0.13	0.25	0.10	0.15
Average Net Carrier Earning per Car per Day	3.23	1.67	2.79	0.90	1.23
Average Mileage per Car Operated	177,232	172,305	168,225	165,577	164,396
Average Journey per Passenger (Miles)	789	793	732	596	556
Average Miles per Car per Day	485	472	461	454	449
Average Loading per Car (Passengers)	21.31	21.18	17.80	11.47	10.01

[1] From all sources after deducting contract revenue payments to railroads.
[2] Including allocated portion of federal taxes on income.
[3] After appropriation of $2,500,000 to reserve for postwar re-adaptation of Pullman equipment.
[4] After credit of $2,743,910 covering 1942 deferred maintenance.
[5] After provision for federal taxes on income.
[6] Including 626 special government-owned troop cars installed late in 1943 and operated for Army Transportation Corps.
[7] Including 1,238 special government- and railroad-owned troop cars installed late in 1943 and early in 1944, and operated for Army Transportation Corps.

C. T. C. Installed "West of the Pecos"

Long sidings, with signals, on the Santa Fe permit freights to make non-stop meets almost as well as on double track

THE Atchison, Topeka & Santa Fe has installed centralized traffic control on 105 miles of single track between Belen, N. M., and Vaughn, which is the Second district of the Pecos division. A second project, now under way, extends the C. T. C. on the First district between Melrose, N. M., and Joffre. These two projects comprising 202 miles of C. T. C., together with new double track between Clovis and Melrose and between Joffre and Vaughn, will permit continuous operation by signal indication between Clovis and Belen, 240 miles.

Characteristics of the Line

Between Newton, Kan., and Dalies, N. M., the latter being 10.3 miles west of Belen, the Santa Fe has two widely separated routes. The northern route, via La Junta, Colo., has heavy grades up to 3.5 per cent, and all but four of the through passenger trains between Chicago and California are routed that way. The southern route, via Amarillo, Tex., and Vaughn, N. M., has low grades except for one section of 1.25 per cent on 26 miles between Becker and Mountainair, and, therefore, the through freight traffic is handled on this route. The Santa Fe line from Galveston, Houston, Ft. Worth and Dallas, connects with the east-west line at Clovis, N. M., 131 miles east of Vaughn, so that the Pecos division between Clovis and Belen handles traffic between points in Texas and California, as well as between Chicago, Kansas City and California.

The elevation above sea level is 4,806 ft. at Belen, 6,492 ft. at Mountainair, and 5,958 ft. at Vaughn. Going east from Belen Yards, the line rises on a grade ranging from 0.5 to 0.6 per cent for the first 13 miles to Becker, and from there the grade continues to ascend at rates ranging up to 1.25 per cent for the remaining 26 miles to Mountainair. On this grade the railroad is in the canyon of the Abo river for about 13 miles between Sais and Abo, and in this section there are seven 4-deg. curves and six 2-deg. curves. The locomotives assigned to through freight service are rated at 4,500 tons, and each eastbound train has a helper which is cut in at Belen and cut out at Mountainair.

From the summit west of the station at Mountainair the grade descends eastward for 68 miles to Vaughn at varying rates between 0.3 and 0.6 per cent, except for 4 miles between Lucy and Silio where the grade ascends eastward at 0.1 and 0.6 per cent. Throughout the Mountainair-Vaughn territory the railroad is in open country, the curvature being very light, with no curves for more than 1 deg.

Previous Methods

Under the operating arrangement previously in effect train movements were authorized by timetable and train orders, with single-track automatic block signaling protection controlled on the overlap basis. Spring switches were in service at both ends of 14 sidings, and interlockings at both ends of 3 sidings. One siding had a capacity of 90 cars, five sidings a capacity of 110 cars, and 12 sidings a capacity of 130 cars.

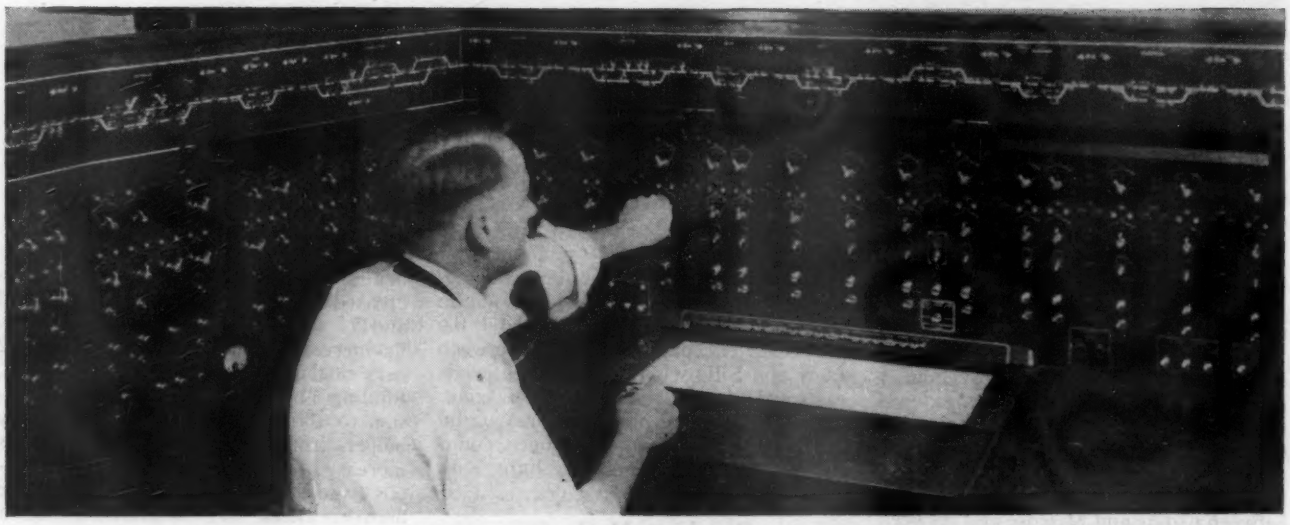
The schedule includes two through passenger trains each way daily. A local freight train was operated each way daily except Sunday. Prior to the war the remainder of the freight traffic was handled in two to three through freight trains each way daily. Thus the total traffic in the years 1930 to 1937 averaged from 12 to 16 trains daily, not including 2 to 3 light engine helper moves westward between Mountainair and Belen.

With the coming of the war the number of passenger trains per day increased to an average of 3.2 eastbound and 5.7 westbound, and the freight traffic increased to a daily average of 762 cars eastbound and 812 cars westbound, totaling about 30 trains daily, in addition to about 10 light engine moves by helpers from Mountainair to Belen. This increased volume of traffic caused serious train delays, especially on the grade between Belen and Mountainair. As a result, in this section the average speed of passenger trains was reduced to 34 m.p.h. westbound and 29.9 m.p.h. eastbound, and freight trains to 14.8 m.p.h. westbound and 7.2 m.p.h. eastbound. Helper engines encountered serious delay in getting back down the hill to Belen, so that the number of locomotives assigned to this service had to be increased to an average of 6.9 daily. On the average 3.8 freight crews were tied up daily on the 16-hr. law. Faced with the necessity not only to expedite train movements but also to handle an ever increasing war-time traffic, a decision was made to lengthen the sidings and install centralized traffic control, including power switch machines and signals for authorizing train movements, thus obviating the train stops and delays which were inherent in the timetable and train order methods.

The novel feature of this project is the use of very long sidings. At 13 stations the sidings were extended to 2 miles or more in length, and at 6 other stations the sidings range from 1.2 to 1.8 miles in length. In addition to a siding 3.4 miles long at Mountainair, there are also two other sidings, one with a capacity of 62 cars, and the other 111 cars. The distances between sidings and the car capacities of sidings, based on 55 ft. to the car, are shown in Fig. 1.

The purpose of lengthening the sidings was not to "hold" more trains but rather to provide track length for a train to keep moving while making a meet with an opposing train. On these sidings the track is constructed and maintained to standards which permit trains to be operated safely at speeds up to 40 m.p.h. At many of the sidings new No. 20 turnouts were installed to permit trains to enter and depart at speeds up to 40 m.p.h. As soon as materials are available No. 20 turnouts will be installed at the remainder of the sidings.

The West End of a Siding Showing a High Leave-Siding Signal at the Left



C. T. C. Control Machine in Passenger Station at Mountainair

Each of these 21 sidings is equipped with track circuits which serve two purposes: (1) to control indication lamps on the track diagram on the C. T. C. machine so that the man in charge may be reminded of the presence of trains on sidings, and (2) these track circuits enter into the control of signals for directing trains to enter. When a switch has been reversed and a signal cleared for an approaching train to enter a siding this aspect informs the engineman that the siding is unoccupied and, therefore, he can pull his train through the turnout and into the clear with promptness rather than dragging along prepared to stop short of a train or a broken rail. Thus the train can use the turnout at the speed for which it was designed.

After his train is in the clear on a siding an engineman can reduce speed but keep moving. In the meantime the man in charge of the C. T. C. control machine can return the entering switch to normal and clear the signal for the opposing train to be met. At least eight times out of ten the opposing train clears the far switch in time for the switch to be reversed and the leave-siding signal to be cleared so that the train on the siding need not stop, but can be accelerated and pull out promptly.

The leave-siding signals are of the three-aspect type which display yellow if only one automatic block ahead is unoccupied, or green if two or more automatic blocks ahead are unoccupied. If the yellow is the best aspect on a leave-siding signal an engineman cannot accelerate to maximum permissible speed until he sees the first intermediate signal, but with a green aspect an engineman can pull his train through the turnout at the speed for which it was designed, and then promptly accelerate to the maximum permissible main line speed.

Can Hold Two Trains

As stated previously, the sidings were lengthened for the purpose of aiding in making non-stop meets, rather than to "hold" trains. On the other hand, in rare instances it is handy to double a train in on a siding behind a train of the same direction which is already occupying the far end. As applying to any one of the 13 long sidings with the intermediate automatic block signals, if the rear of the first train is beyond the intermediate automatic signal on the siding the head-in signal can be cleared by C. T. C. control so that the engineman of the second train will know that the siding is unoccupied as far as the intermediate signal, and, therefore, this second train can be pulled in to stop short of the intermediate signal. If the intermediate signal were not provided, as is true with reference to the 8 shorter sidings, a second train would be stopped at the station-entering signal and then enter the siding under flag protection. Fig. 2 shows the track and signal arrangement at Carnero, which is typical of the 12 long sidings.

The possibility of making non-stop meets between opposing trains depends not only on long sidings but also on short time-distance between sidings, so that, with a better than average break, a train can be directed to move on over to the next siding and enter on short time, rather than being held back at the previous siding. Train speed and distance are the factors which determine the time-distance between sidings. The maximum permissible speeds in this district are 90 m.p.h. for passenger trains and 50 m.p.h. for freight trains. Re-

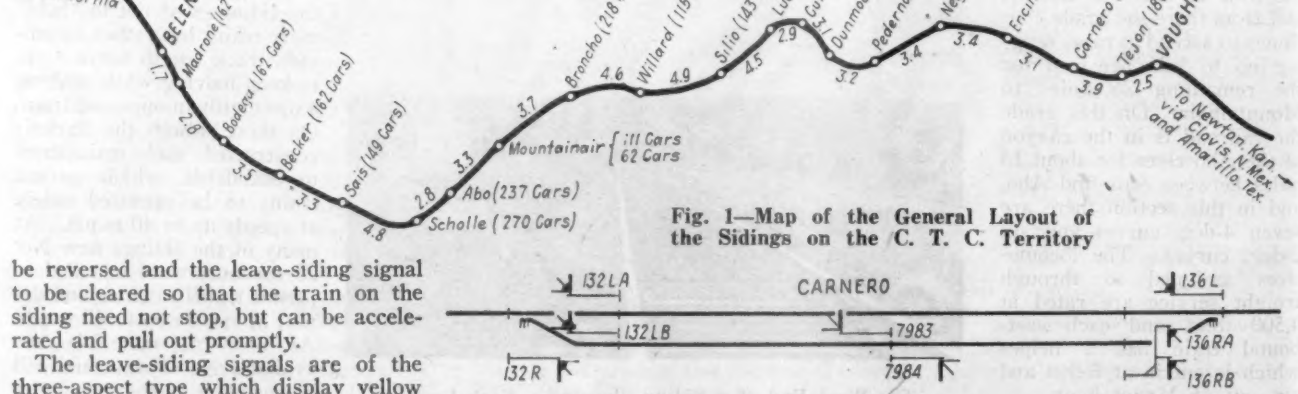


Fig. 1—Map of the General Layout of the Sidings on the C. T. C. Territory

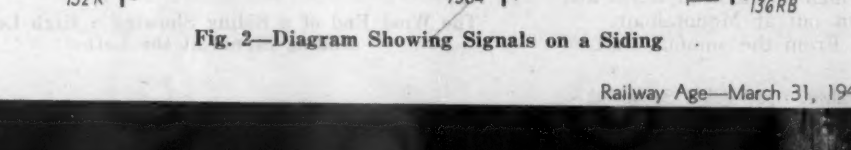


Fig. 2—Diagram Showing Signals on a Siding

strictions below these maximum are, of course, necessary on the grades as well as on some of the curves, the locations of which were discussed previously.

The distances between sidings on this project are comparatively short. As shown in Fig. 1 the distance in miles from the west switch of one siding to the east switch of the next siding ranges from 2.7 miles to 3.5 miles, with certain few exceptions. The outstanding exception is the 4.7 miles between Sais and Schole. In this section the grade is 1.2 per cent ascending eastward so that the speed is slow for eastward trains, thereby increasing the train time. This situation cannot easily be remedied because the railroad is in a canyon with no space available for another siding. Thus with these few execptions the time-distances between sidings on this project are short not only because of short distances but also because of the long turnouts and signals which permit trains to enter and leave sidings promptly.

These advanced practices in track layout with C. T. C. have proved to be advantageous as is indicated by studies of train operation before and after the project was placed in service on the section between Belen and Mountainair. Although the number of freight cars handled daily increased from 762 to 891 eastbound, and from 812 to 991 westbound, the average speed of freight trains increased from 14.8 m.p.h. to 24.5 m.p.h. westbound, and from 7.2 m.p.h. to 14.6 m.p.h. eastbound. On account of delays when returning from Mountainair to Belen, a helper locomotive and crew could be used for only one trip. Now the delays have been reduced so that a helper crew can help two, and sometimes three, trains up the hill and return to Belen. Counting road crews, as well as helper crews, the number of crews tied up on the 16-hour law was reduced from 6.9 to 0.1 per day.

Types of Signals Used

The automatic block signals previously in service on this division were the upper-quadrant three-position type. When changing over to C. T. C. the old semaphore mechanisms, spectacles and blades were scrapped. The masts were shortened and reused to mount the new searchlight type signal heads which are the H-5 type with quick detachable plug-in mechanisms. In order that the aspects may be seen as far as practicable and without the possibility of interference locally, no dwarf signals are used, and, therefore, all signals on the sidings as well as on the main track are high signals. All signals are at the right of the track governed. Where practicable to do so the sidings were thrown over to 18-ft. centers to allow clearance for a high signal on a mast. Where space was not available to throw the siding the signals are on overhead bridges or cantilevers.

The power switch machines are the d-c. low-voltage type rated to operate in 14 seconds with 24 volts at the motor. In the No. 20 turnouts the switch points are 30 ft. long, and, in order to prevent flexing of the points a second operating connection is attached to a tie rod approximately 14 ft. from the point, with crank and pipe connections to the operating connection on the No. 1 rod.

C. T. C. Control Machine

The C. T. C. control machine for the entire 105 miles of territory is located in an office on the second floor of the station at Mountainair. The center panel is 5 ft. long and at each side there are two panels which set at angles to form a "U" shape, the length of the five panels being 15 ft.

The illuminated track diagrams on these machines include a lamp to repeat the occupancy of: (1) Each OS switch detector section; (2) each passing track; (3) each section of main line opposite a passing track; and (4) each section of single-track main line between two passing tracks. The switch and signal levers, as well as the indication lamps above these levers are of the conventional arrangements.

The track changes and centralized traffic control on this project were planned and constructed by the forces of the Atchison, Topeka & Santa Fe, the major items of the signaling equipment being furnished by the Union Switch & Signal Company.

Pullman, Inc.

(Continued from page 590)

or sleeping car business. The new order, by the United States District Court at Philadelphia gives Pullman, Inc., until March 22, 1946, to arrange for the sale of its capital stock in the Pullman Company, or dispose of the $80 million of physical assets of the sleeping car unit.

The new order has the effect of enforcing the final judgment handed down by a three-judge Federal District Court on May 8 of last year, when Pullman, Inc., was directed to separate its sleeping car business from its manufacturing business conducted by its subsidiary, the Pullman-Standard Car Manufacturing Company. The decree of 1944 was the culmination of an anti-trust suit filed by the government against Pullman on July 20, 1940, and directed Pullman to carry out a plan of separation within one year.

The court order of March 22, signed by Judges John Biggs, Jr., Albert B. Maris and Herbert F. Goodrich, fell short of the Justice Department's demands in a special hearing three days earlier that Pullman, Inc., be ordered to sell its car manufacturing business in the event it fails to dispose of the sleeping car unit. No ruling was made in the event of such failure. The government, represented by Fowler Hamilton, special assistant attorney general, had further argued that Pullman, Inc., be not permitted to "retire" or "withdraw" from the sleeping car business and thus leave the traveling public and the railroads without such service. But the court, instead of directing Pullman, Inc., to offer the business to any responsible buyer, limited its order to the statement that Pullman, Inc., in the sale of its business or stock, "may cause the Pullman Co. to offer to treat with the railroads or any other persons."

At the earlier hearing, Mr. Hamilton had also opposed the suggestion of Pullman, Inc., that railroads now using Pullman sleeping car service band together as a buying group, terming this merely a "gesture of compliance."

The court reserves jurisdiction under the new order and no sale can be made without its agreement. This gives Pullman, Inc., until March 22, 1946, either to sell its stock or contract to sell the sleeping car business.

Commenting on the provisions of the order, Pullman Company Vice-President George A. Kelly said that it gave Pullman "broad freedom of action in its effort to dispose of its sleeping car subsidiary, the Pullman Company," and that "we regard this order as properly considerate of the public interest, of the interests of our employes and of the interest of the 35,000 stockholders of Pullman, Inc."

* * * *

Army Pictorial Service

Beneath Brush and Other Camouflage Allied Troops Found This French Diesel Car, Which Retreating Germans Had Oiled and Greased Preparatory to Flight

Railroads-in-War News

Capital Expenditures Increased in 1944

Total was $560,112,000, up $105,830,000 from the previous year

Capital expenditures for equipment and other improvements to railway property made by Class I railroads in 1944 totaled $560,112,000, the greatest for any year since 1930, according to the Association of American Railroads. The 1944 total was an increase of $105,830,000 above that of 1943.

Of total capital expenditures made in 1944, $328,231,000 were for locomotives, freight-train cars, passenger-train cars and other equipment and $231,881,000 for roadway and structures. Capital expenditures for equipment exceeded by $72,250,000 those in 1943, and expenditures for roadway and structures were $33,580,000 above the preceding year.

Equipment—Capital expenditures for locomotives in 1944 totaled $178,017,000 compared with $142,070,000 in 1943, and $113,834,000 in 1942. For freight-train cars, capital expenditures amounted to $134,533,000, compared with $97,890,000 in 1943, and $201,112,000 in 1942. For passenger-train cars, the amount of capital expenditures totaled $1,921,000 in 1944, the smallest amount spent for that purpose in any year since 1922, the first year such reports were filed. In 1943 such expenditures totaled $5,828,000, and in 1942, they were $24,075,000. Expenditures for other equipment last year amounted to $13,760,000, compared with $10,195,000 in 1943, and $10,353,000 in 1942.

Of the $231,881,000 spent for roadway and structures, about $100,000,000 was used for improvement of tracks and sidings. For additional track, capital expenditures in 1944 totaled $20,616,000 compared with $18,493,000 in the preceding year. For yards and sidings, expenditures in 1944 totaled $36,666,000 compared with $39,254,000 in the year before, and for heavier rail the railroads spent $35,720,000, or an increase of $3,493,000 above such expenditures in 1943. In addition, the railroads spent $6,997,000 in 1944 for additional ballast and $25,088,000 for bridges, trestles and culverts.

Shops—Expenditures for shops and engine houses in 1944 amounted to $28,131,000, or an increase of $12,516,000 above the year before, and for station and office buildings and other station facilities, $13,433,000, which was more than three million dollars above such expenditures in 1943. For signals and interlockers, including telephone and telegraph lines and automatic train control, they expended $22,091,000 in the past calendar year, or an increase of $6,000,000 above 1943, and for other improvements, $43,139,000, or an increase of approximately $3,690,000 compared with the year before.

The A. A. R. statement gave the capital expenditures made annually by the Class I roads in the past 15 years as follows:

1944	$560,112,000
1943	454,282,000
1942	534,897,000
1941	543,021,000
1940	429,147,000
1939	262,029,000
1938	226,937,000
1937	509,793,000
1936	298,991,000
1935	188,302,000
1934	212,712,000
1933	103,947,000
1932	167,194,000
1931	361,912,000
1930	872,608,000

Post-War Equipment for France

State Department agreements with the Provisional Government of France include provisions whereby that country would obtain 30-year credits with interest at 2⅜ per cent for the post-war acquisition in this country of $320,000,000 worth of railroad equipment, according to Representative Hull, Progressive of Wisconsin.

Mr. Hull made his statement in discussing the Department of Agriculture Appropriation Bill for the fiscal year ending June 30, 1946, when it was before the House on March 24. He was calling attention to "some of the 'economy' which is going on at a time when Congress is devoting so much attention to paring down the amounts needed for farmers."

The agreement to which Mr. Hull referred was made "on or about" February 28, he said. As he understood it, there were provisions for $1,675,000,000 worth of lend-lease goods to be shipped before the end of the war, and arrangements for post-war goods to cost $900,000,000. The latter figure includes the railroad equipment—$200,000,000 for locomotives and $120,000,000 for cars. Mr. Hull's list also included $140,000,000 for merchant marine ships, $32,000,000 for harbor watercraft, and $50,000,000 for inland watercraft, including barges.

Asks $11,000,000 for O. D. T.

President Roosevelt last week sent to Congress a budget estimate recommending an appropriation of $11,000,000 for the Office of Defense Transportation for the fiscal year ending June 30, 1946. For the current fiscal year, O. D. C. has received appropriations totaling $17,000,000, but that amount includes some $2,500,000 for the payment of overtime compensation to employees under the act of May 7, 1943, which expires next June 30. Presumably there will be a supplemental request for fiscal 1946 if new legislation continuing the overtime is enacted.

Cut Off 50 Trains Under O. D. T. Order

Operation after March 1 banned unless passenger load averaged 35%

Reports received by the Office of Defense Transportation indicated that its General Order No. 47 had brought about the discontinuance on March 1 of some 50 passenger trains, producing a "savings" of about 5,500 train-miles a day, it was announced March 26. These trains were discontinued under the provisions of the order (reported in *Railway Age* of January 20, page 198) banning operation, after March 1, of passenger trains with an average occupancy of less than 35 per cent during the previous November. (Subsequently, the order was modified to permit use of a later base month in cases where November records were inadequate for this determination.)

With adequate reports available for 38 of the 50 canceled trains, the O. D. T. estimated that discontinuance of those 38 trains would result in an annual saving of 69,000 tons of coal, in release for other purposes of 22 locomotives, and in freeing for more essential railroad work more than 100 employees directly concerned with the operation of these trains. In addition, savings in the use of equipment and in the time of yard and maintenance personnel were expected.

Apart from the savings realized through compliance with this order, voluntary discontinuance of certain passenger train service has brought about additional releases of equipment and personnel, the O. D. T. pointed out. On two roads alone, the Baltimore & Ohio and Pennsylvania, it was explained, 28 locomotives had been released for other work by rearrangement of various passenger train schedules.

To Affect Summer Trains—At the same time the O. D. T. pointed out that another provision of General Order No. 47, that prohibiting the operation of seasonal trains to vacation or resort points, would result in additional curtailments in the use of equipment, fuel and personnel this summer, since it will operate to prevent institution of seasonal trains on certain lines where this has been a normal practice. It was not practicable to estimate with any degree of accuracy how many trains would be affected by this phase of the order, which probably would be felt particularly in areas adjacent to the larger eastern cities.

While the O. D. T. stated that "discontinuance of the passenger trains has not resulted in any community being deprived of essential transportation," evidence was

Trains	Frequency	Terminals	miles
Boston & Maine			
	Sun. only	Boston, Mass.-Intervale, N. H.	140
Central of New Jersey			
120-121	daily	Jersey City, N. J.-Tamaqua, Pa.	135
Central of New Jersey-Reading			
610-611	daily	Jersey City-Philadelphia, Pa.	90
Chicago, Indianapolis & Louisville			
5-6	daily	Chicago-Louisville, Ky.	325
19-28	daily	Orleans, Ind.-French Lick	18
35-36	daily	Chicago-Indianapolis, Ind.	183
Chicago & Illinois Midland			
5-6-7-8	daily	Pekin, Ill.-Springfield	85
Chicago, Milwaukee, St. Paul & Pacific			
204-207	daily	Des Moines, Iowa-Madrid	34
Chicago & North Western			
201-202	Except Sun.	Powers, Mich.-Iron River	68
714-715	Except Sun.	Rapid City, S. D.-Newell	77
Delaware, Lackawanna & Western			
1803-1806	daily	Binghamton, N. Y.-Utica	95
9	Sat. only	Hoboken, N. J.-Buffalo, N. Y.	395
Gulf, Mobile & Ohio			
109-110	daily	Tuscaloosa, Ala.-Montgomery	107
Illinois Central			
333-334	Except Sun.	Effingham, Ill.-Indianapolis, Ind.	177
Lehigh Valley			
301-302	Except Sun.	Ithaca, N. Y.-Auburn	43
Minneapolis & St. Louis			
17-18	Except Sun.	Winthrop, Minn.-Ft. Dodge, Iowa	189
Minneapolis, St. Paul & Sault Ste. Marie			
86-87	Except Sun.	Gladstone, Mich.-Sault Ste. Marie	151
105-106	Except Sun.	Glenwood, Minn.-Enderlin, N. D.	136
107-108	Except Sun.	Enderlin-Minot	212
New York Central			
223-245 210-248	daily	Buffalo, N. Y.-Suspension Bridge	27
336-337	daily	Syracuse, N. Y.-Oswego	37
629	Except Sun.	Cleveland, Ohio-Toledo	107
Southern (Carolina & Northwestern)			
1-2	Except Sun.	Chester, S. C.-Lenoir, N. C.	110
Southern Pacific			
357-358	daily	Niland, Cal.-Calexico	41
Western Maryland			
1-4	Except Sun.	Cumberland, Md.-Elkins, W. Va.	112

available in the remarks of Congressmen and in the appearance of delegations from various points seeking exceptions from the order that this opinion was by no means undisputed, and there was reason to believe that certain hardship cases might perhaps be recognized, with a corresponding effect on the number of trains cut off under the terms of the order.

The fifty trains discontinued under the 35 per cent occupancy provision, as reported to the O. D. T. on the basis of plans formulated in advance of its effective date, are indicated in the accompanying table.

Presidential Unit Citation for Former N. Y. C. Fireman

Pfc. Walter E. Cary, who was employed as a fireman on the Buffalo and Syracuse division of the New York Central before joining the Marines in January, 1943, has been awarded the Presidential Unit Citation for gallantry in action while serving with the 4th Marine Corps in the battle for Saipan and Tinian. Private Cory also was in the battles for Roi and Namur in the Marshall Islands.

734th Op. Bn. Speeds Supplies to Fast-Moving Ninth Army

Though a comparative newcomer to the Continent, having been activated in the United States only shortly before D-Day, the 734th Railway Operating Battalion now is supporting the advance of the Ninth Army in the big Allied drive into Germany. This outfit had been dispatched to Belgium from England shortly before the German counter-offensive of December, and since then, the 734th, under command of Maj. Ralph E. Johnson, of Houston, Tex., former trainmaster on the Texas & New Orleans, has been subjected to V-bombs, strafing and bombing attacks.

Typical of the railroad engineers operating to the Army's new supply dump, within easy reach of advancing troops, is Sgt. James E. Darby, of Tampa, Fla., a former Seaboard fireman. It is recorded that on more than one occasion Sgt. Darby has raced V-bombs or brought his train to a halt while German planes attempted strafing or bombing attacks. One assignment during that period was a 76-hr. run with a load of 155-mm. artillery ammunition. Pfc. Samuel H. Grammer, Jr., of Woburn, Mass., the conductor in that case, recalled it as "stop and go" operation, with six Luftwaffe raids and uncounted numbers of V-bomb threats.

The battalion's executive officer, Capt. John A. Southworth, of Columbus, Ohio, was for 21 years with the Pennsylvania, having been employed as machinist and toolmaker.

I. C. C. Service Orders

The expiration date of Interstate Commerce Commission Revised Service Order No. 263, establishing sliding scale demurrage charges on tank cars, has been extended to June 1 by Amendment No. 3 to that order. According to Col. J. Monroe Johnson, director of the Office of Defense Transportation, this extension was "absolutely essential" because the "railway tank car situation continues so intensely critical."

Amendment No. 1 to Second Revised Service Order No. 244, effective March 24, clarified the definition of "grain" subject to that order to clear up misunderstandings, specifically including flaxseed and soybeans under the provisions of the order.

Service Order No. 298, effective March 28 through April 28, required the Seaboard Air Line to route all cars moving under Symbol 32 designation via the Winston Salem-Southbound, Norfolk & Western, Western Maryland, Reading, Central of New Jersey, and Staten Island Rapid Transit, through Wadesboro, N. C., Hagerstown, Md., and Allentown, Pa., when originating at Baytown, Tex., and destined to Gulfport, N. Y., instead of regular routing. Such routing "is deemed to be due to carrier's disability."

The provisions of Special Order No. 37 of the Association of American Railroads' Car Service Division, limiting the loading of ventilated box cars of southeastern roads in that territory, have been amended to make the order applicable to such cars of Central of Georgia ownership.

Army Railroading in Eight Countries

The First Military Railway Service of the Transportation Corps, U. S. Army, has issued an attractive 32-page illustrated brochure entitled "American 'Rails' in Eight Countries."

Intended for distribution among members of this branch of the Army as an historical memento, the inside cover provides blanks where the soldier may inscribe his name, date of enlistment, date of assignment to M. R. S., date of arrival in the European Theater of Operations, and awards and citations.

A foreword, entitled "Bread and Bullets," tells how the First M. R. S. forms part of an organization originally known as "Services of Supply, North African Theater of Operations," later "Communications Zone, Mediterranean Theater of Operations," and now as "Southern Line of Communications, European Theater of Operations"—all the time, in North Africa, Sicily, Italy and Southern France, under direct command of Major General T. B. Larkin, with Brig. General George C. Stewart as his chief of transportation.

The preface to the booklet—which recounts the experience of the railway units rather than all branches of the Transportation Corps—is written by Brig. General Carl R. Gray, Jr., director general of the M. R. S.; and the text proper gives an illustrated history of the First M. R. S. all the way from Fort Snelling, Minn., and Camp Claiborne along the eventful road through North Africa, Sicily and Italy to France.

Citations and awards for merit are listed at the end of the booklet. It is published by the Special and Information Service, Headquarters, Southern Line of Communications, E. T. O., and has been passed by the Field Censor for mailing to the U. S. A.

B. & O. Man Heads Solid Fuels Agency's Transportation

Solid Fuels Administrator Harold L. Ickes has announced the appointment of Clark M. Groninger of Baltimore, Md., coal traffic manager of the Baltimore & Ohio, as assistant deputy solid fuels administrator in charge of transportation, succeeding in that position Fred K. Prosser, coal traffic manager of the Norfolk & Western, who has resigned from the S. F. A. staff to return to his post at Roanoke, Va., after serving the government agency for more than a year. His appointment was reported in *Railway Age* of February 5, 1944, page 324.

Mr. Groninger, whose appointment has become effective, is on indeterminate leave of absence from the B. & O., after having been in that road's employ since 1912, except for a period of service overseas in

the 309th Engineer regiment in World War I. He entered railroad service as a stenographer at Chillicothe, Ohio, his home town, and later was employed in the freight offices at Akron, Ohio, and Youngstown.

Upon his release from the armed forces he was appointed B. & O. freight representative at Cleveland, Ohio, which post he held from September, 1919, to March, 1920, when he was transferred back to Akron as district freight agent. After holding similar positions at Springfield, Ill., Garret, Ind., Newark, Ohio, and Baltimore, Md., Mr. Groninger on April 1, 1931, was named assistant general freight agent at Cleveland, being advanced to general freight agent of the B. & O. and the Alton at St. Louis, Mo., on January 1, 1937. From this post he was promoted in January, 1943, to coal traffic manager of the B. & O., with headquarters at Baltimore.

Good Week for Petroleum and Coal Transport

The week ended March 17 was a good one so far as railroad transportation of petroleum and coal was concerned, according to reports from the Petroleum Administration for War and the Solid Fuels Administration for War. As Deputy Petroleum Administrator Ralph K. Davies put it, "tank car trains 'highballed' into the East coast with an average delivery of 546,447 barrels a day of crude oil and petroleum products"; and Solid Fuels Administrator Harold L. Ickes reported that the week's good weather and "much improved railroad car supply" accounted for a 940,000-ton increase in soft coal output.

With respect to the petroleum movement Mr. Davies noted that it was the highest daily delivery by tank car since the week ended September 16, 1944, when 549,212 barrels a day were hauled into the East coast area. "It is fortunate," he added, "that tank cars are again operating according to the programmed schedule, because once again we will have to depend on the tank cars, along with the pipe lines and the barges, to carry the brunt of the burden of supplying civilian as well as military demand along the eastern seaboard during the spring and summer months. Tankers are now being withdrawn from Gulf Coast-East Coast service to meet urgent overseas military requirements."

Box car shipments of kerosene in drums to New England were sustained at high levels during the week ended March 17, Mr. Davies also reported. They averaged 19,703 barrels a day, up 611 barrels daily from the previous week's shipments. Meanwhile pipe lines continued their "above-rated-capacity performance."

With respect to the coal car supply situation, Solid Fuels Administrator Ickes reported that the shortage in the March 17 week was only 1,485 cars as compared with 5,041 cars in the week ended March 10. The March 17 week's total bituminous production was 11,825,000 tons compared with the previous week's 10,885,000 tons. Anthracite production totaled 1,214,000 tons compared with 1,107,000 tons.

Materials and Prices

The following is a digest of orders and notices that have been issued by the War Production Board and the Office of Price Administration since March 19, and which are of interest to railways:

Cordage and Insect Cloth—Manufacturers of (1) manila, sisal, henequen, jute, and istle cordage; twine and jute rope yarns, and (2) metal insect screened cloth have been granted the right to use an AA-1 preference rating for their maintenance, repair and operating supplies. Formerly, manufacturers were eligible to use the AA-5 preference rating for MRO supplies.

Electric Lamps—The supply of tungsten and copper for the manufacture of incandescent and fluorescent lamps continues tight; however, the production of lamps is being maintained at a high level and is expected to be sufficient to meet civilian requirements, despite reductions in the supply of materials available to manufacturers. The total amount of tungsten alloted to lamp manufacturers for use in April, is about five per cent less than that alloted for March, and the amount of copper available in the second quarter of 1945 is expected to be about 40 per cent below the quantity allotted in the first quarter.

Heavy-Duty Tires—Production schedules of 4,875,951 heavy-duty tires for the first quarter will be achieved substantially despite shortages in carbon black and tire cord, but chances for achieving the greatly increased second quarter production of 5,726,671, as programmed last November, appears extremely unlikely, the W. P. B. reported recently in connection with the publication of the 1944 year-end Report of the Rubber Bureau. In fact, the second quarter schedule for truck and bus tires has been revised downward to 5,085,604.

Gradual improvement in April, with a still further step-up in May, is forecast, however, as a result of intensive measures being taken to increase the output of carbon black, W. P. B. said, until the over-all result will largely overcome the situation by the end of the second quarter when the production of components is expected to keep pace with the large increases in tire requirements.

Heavy Melting Scrap—Stocks of heavy melting scrap have dropped to dangerously low levels, partially as a result of misleading press reports of plentiful supplies, W. P. B. said recently. Heavy scrap inventories are now down to 1942 levels, at which time shortages caused the shutdown of some open-hearth furnaces.

To obtain maximum steel production, heavy scrap must be made available to producers of steel and castings and only a small percentage of light scrap, such as turnings, can be charged into the melting furnaces, W. P. B. said.

Confusion regarding the scrap iron situation has been accentuated, W. P. B. spokesmen said, by reports that scrap is plentiful, whereas only turnings scrap is readily available and the vital heavy scrap is in extremely short supply. They emphasized, however, that turnings are acceptable in a balanced charge of scrap for open-hearth furnaces and that mills must revert to the 1942 procedure of using more turnings to offset the lack of heavier steel scrap. The recent cutback in plate production for the U. S. Maritime Commission caused a sharp drop in a former good source of heavy scrap, W. P. B. said.

To build up inventories of No. 1 and No. 2 heavy smelting scrap, the industry advisory committee concurred in a scrap speed-up program including an industry pledge that it would "buy up to a 45-day supply of usable scrap iron and steel (where inventories are below that level), and maintain such inventories as long as urgent war needs prevailed (based on a 90-day order backlog)." The committee reported, however, that it did not represent the majority of the steel mill scrap buyers and, accordingly, the members would endeavor to enlist the support of the industry's standing scrap iron committee in the revitalized scrap program.

Surplus Property Tipster Sheets—"Large and easy profits" through purchases of surplus property is the headline used by a growing crop of tipster sheets now flooding the public mail, Guy M. Gillette, Chairman of the Surplus Property Board, said recently. These tipster sheets profess to give inside information, for a substantial fee, that will get purchasers in on the "ground floor."

"While these tipster sheets do not always come within the range of criminal action," Mr. Gillette said, "they apparently offer little or nothing that a business man cannot get himself if he takes the trouble to inquire at any of the authorized Government disposal agencies." The many regional offices of these authorized disposal agencies maintain lists of business concerns to which they regularly mail complete details of available surpluses. These lists include a description of the property offered, its condition, the quantity involved, its location, and the method of sale to be employed.

The Surplus Property Board itself is a policy organization and does not maintain a public mailing list. However, to any business man making the request, it will mail a copy of the Buyer's Guide, containing full details respecting the disposal agencies, the types of properties sold by each and the addresses of their regional offices. The principal disposal agencies are: Treasury Department, for consumer goods; Reconstruction Finance Corporation, for plants, machine tools and other capital and producers' goods; War Food Administration, for food; United States Maritime Commission, for small vessels and marine equipment; and the National Housing Agency, for war housing property.

The S. P. B. stressed the fact that nobody outside the Government has access to information regarding available surplus property that cannot be had by any business man merely for the asking. The exaggerated claims of "inside knowledge" will be tracked down by the board's compliance staff and steps taken to see that every interested legitimate purchaser is put in touch with the authorized Government disposal agencies, S. P. B. said.

Prices

Hardwood Plywood—Producers' specific dollar-and-cent base ceiling prices for six grades of sweet or black gum, tupelo and all other southern hardwood plywood manufactured in O. P. A. pricing Zones No. 2 and 3 are provided by Amendment No. 2 to MPR-568, effective March 26.

The new ceilings are at the same general level as has been specially approved in the past for individual producers in the two zones. The six grades are those manufactured according to Government specifications for war program use. Zone No. 2 is made up of Kentucky, Tennessee, Missouri, Illinois, Indiana, Ohio, West Virginia, Virginia, Maryland, Delaware, New Jersey and Pennsylvania. Zone No. 3 is composed of Minnesota, Wisconsin, Michigan, New York, Connecticut, Rhode Island, Massachusetts, New Hampshire, Vermont and Maine.

Railway Specialties—Increases of three per cent in the ceiling prices for rigid and swivel yokes and of eight per cent for sideframes in the railway steel castings specialties field have been provided by Amendment No. 14 to RPS-41, effective March 22. The former ceilings, O. P. A. said, are "too low to be generally fair and equitable." The increases are price adjustments made on the "product standard" basis, and are designed to permit producers of railroad specialties to cover "out of pocket" costs on the items.

A study by O. P. A. of financial data of producers of steel castings and railroad specialties was undertaken recently at the request of the Railroad Specialties Industry Advisory Committee. This study disclosed that increases in yoke and sideframe ceilings were required under the Emergency Price Control Act, as amended, to enable producers to recover "out of pocket" cost on the bulk of the output of these items. The The study also showed that ceiling prices for bolsters and couplers did not need to be increased under this standard.

Tires and Tubes—Wholesale ceiling prices for a new category of tires and tubes, known as factory rejects, have been established by Amendment No. 4 to RMPR-143, effective March 26. The ceilings are 25 per cent less than the ceilings for factory seconds when the factory reject tire or tube is repaired before being sold, and less an additional 40 per cent of the latter price when sold unrepaired.

Only a very limited number of factory reject new tires and tubes are expected to be available for sale, O. P. A. said. All factory rejects, as well as factory seconds, will be marked as such by manufacturers.

GENERAL NEWS

Land-Grant Repealer Reported to House

Enactment of new Boren bill is recommended by interstate commerce committee

Following through from its recent approval of the measure, the House committee on interstate and foreign commerce on March 26 filed in the House a favorable report on H. R. 694, the bill introduced by Representative Boren, Democrat of Oklahoma, to repeal remaining provisions of the land-grant-rate law. The report was accompanied by an expression of the minority views of Representative O'Hara, Republican of Minnesota, who opposes the bill.

The bill is the same as the previous Boren bill which passed the House last year only to die with the seventy-eighth Congress when the Senate failed to act on the amended version reported from its committee on interstate commerce. The present House committee report states that no important change in the situation has occurred since the bill's predecessor passed the House, "except that the intervening period has further emphasized the need for this legislation."

Deductions Total $900 Million—In this connection the report later on estimates that the railroads have by now contributed by rate reductions "over $900,000,000 in payment of the lands which were transferred to them under the land-grant acts." It is further calculated that this is "double the amount received for the lands sold by the railroads plus the estimated value of such lands still under railroad ownership." The $900,000,000 estimate is built up by adding deductions at the rate of $20,000,000 a month since June 30, 1943, to the cumulative total of $580,000,000 as of that date given in testimony presented at August, 1944, Senate interstate commerce committee hearings by Robert E. Webb, former chairman of the defunct Board of Investigation and Research. It is also noted that the late Joseph B. Eastman had estimated that the total value of lands granted to the railroads "was not more than $126,000,000."

One section of the report is devoted to objections to the bill which have been raised by government departments. There it is noted that protests have come from the War and Navy departments because their transportation costs would be increased.

Like objections have come from the Treasury Department, while the Secretary of the Interior called the bill "objectionable," but argued in the alternative for an amendment which would require the railroads to return granted lands still held by them.

Informed Agencies Favor Repeal—"On the other hand," the report continues, "those departments of the government which are most familiar with the situation unhesitatingly recommend the enactment of this legislation. We call attention again to the testimony of Commissioner Mahaffie, both in the House and Senate hearings, expressing the view of the Interstate Commerce Commission that the land-grant statutes should be repealed. We also mention in this connection a letter from the acting director of the Office of Defense Transportation, General C. D. Young, in which he unqualifiedly endorses the bill. By reference to the Senate hearings, it will be found that the present director of the Office of Defense Transportation, Colonel J. Monroe Johnson, supports the bill without qualification."

The report next quoted from the I. C. C.'s presentation in favor of the bill, calling that presentation an endorsement "in no uncertain manner" from the "official body of the government that has greatest responsibility for railroad policies, for the just treatment of the carriers, and for the maintenance of an efficient transportation system." Also mentioned is the fact that shippers generally "are particularly anxious that the discriminations and inequalities existing in the present law shall be removed." The National Association of Railroad and Utilities Commissioners is reported to have taken a like position.

Time to Renegotiate—The remainder of the report reproduces discussion and arguments from the committee's report on last year's bill, which was reviewed in the *Railway Age* of May 6, 1944, page 862. Among such discussion is an expression of the committee's view that the government should not hesitate to apply the principle of contract renegotiation against itself at a time when it is insisting upon its right to compel its citizens to renegotiate their contracts with it.

Representative O'Hara's statement protested against the refusal of the committee to hold hearings again this year and argued that Congress should go slow in canceling the obligation which the land-grant laws impose on railroads. "It is incomprehensible," he said, "that in time of war, with land-grant railroads earning more money than ever before in history, without a determination of what this action is going to cost the taxpayers of this country, without any definite promise of adjusments in freight or passenger rates, that the Congress should cancel a solemn obligation which is of benefit to the country generally, and which bill if passed would amount to taking money from the taxpayers' pockets and transposing it to the treasury of railroads affected."

Says Spotting Service Should Suit Shippers

Alldredge disagrees with view that carrier convenience should be only guide

Interstate Commerce Commissioner Alldredge thinks the commission is proceeding "contrary to the statutory authority under which we function" when it adheres to the doctrine that car spotting services available under line-haul rates must be determined "solely by the convenience of the carrier" without reference to the situation and needs of the shipper or consignee. The Alldredge views, to which Commissioners Aitchison and Mahaffie subscribed, were embodied in a dissent to the commission's report on that phase of the Ex Parte 104 terminal services investigation which involves spotting operations performed by the Wabash and Illinois Terminal in serving the soya bean processing plant of Spencer Kellogg & Sons, Inc., at Decatur, Ill.

Another recent commission report in the same proceeding involved spotting services performed by the Michigan Central and Detroit, Toledo & Ironton at the Ecorse (Detroit), Mich., plant of the Great Lakes Steel Corporation. Here again Mr. Alldredge dissented, and Mr. Mahaffie went along with him once more while Commissioner Aitchison that time remained with the majority.

Switching Rations—In the Spencer Kellogg case the commission ruled in effect that the line-haul rates entitled the industry to only one switch a day, except during harvest-season peaks when additional switches might be made. It found that charges in addition to the line-haul rates should be made for what it called "special deliveries," and for other specified switching moves. The decision in the Great Lakes Steel case was a report on reconsideration, the commission reviewing the situation in the light of changes in operating and other conditions at the plant since the previous report by Division 3. Here also the majority report fixed the limits of service to be accorded under the line-haul rates and found that payment of an allowance to Great Lakes for service beyond the points thus fixed would be unlawful. This decision did provide however, that hot metal trains might be moved by the railroads to a more convenient place, provided certain changes are made in the routing of such trains through the plant.

What RR's Obligation Is—In his dissent to this decision, Commissioner All-

dredge expressed the opinion that the industry was entitled to more spotting services under the line-haul rates than the majority conceded to it; but it was in his separate expression in the Spencer Kellogg case that he expounded his general views with respect to the issues involved. There he dissented from "the fundamental legal precept" expressed in the majority report which was by Commissioner Patterson.

Commissioner Alldredge pointed out that the case involved no questions of allowances to the industry or of intraplant switching services. The whole problem, as he saw it, "concerns the extent of the carriers' obligation to render terminal service as an incident to the transportation of carload freight under their line-haul rates." He found that the location and physical layout of the Spencer Kellogg plant are such as to create "no doubt" that they are "well within the ambit of the carriers' general switching operations in that territory." And he asserted that the majority was able to find fault "only with certain incidents to the service now performed by respondents."

The dissenting commissioner then proceeded to express his disagreement with the carrier-convenience-only rule of car spotting. "There is and should be," he said, "a reciprocity of convenience, as well as of need, involved in all the relations between carriers and the public they serve. As in passenger operations a carrier, in order to survive, must adjust its schedules and connections with other roads to meet traveling convenience and need, so in the rendition of freight terminal services the same principle finds one of its most fruitful opportunities for practical application. That is where freight transportation service begins and ends; it is the focal point of direct daily contact between the patron and the carrier."

Mr. Alldredge found "the basic premise upon which all such issues are to be resolved" in section 1(3)'s definition of transportation service as including all services in connection with the receipt and delivery of freight; and in section 1(4)'s imposition of the duty upon railroads to provide and furnish such transportation upon reasonable request therefor. "The imposition of this duty," he went on, "creates a corresponding right in the shipper or consignee to demand that the carrier comply with its statutory obligation, a right we are not privileged to ignore. In determining, therefore, whether a request for the placement of cars for loading or unloading or for rendering necessary switching service as an incident to line-haul transportation is reasonable, we should not be guided solely by the convenience of the carrier unrelated to the situation and needs of the consignee. Such treatment is lopsided, is not in accord with the statute, and is wrong in principle."

Precedents—For these views Mr. Alldredge found support in commission decisions, among them the so-called through-rates case wherein the United States Supreme Court in *Pennsylvania Railroad Co. v. United States* (decided January 29, 1945) upheld the commission's claim of authority to prescribe through routes for the convenience of shippers even though participating railroads be short-hauled. The primary objectives of these terminal services investigations, as the dissenting commissioner sees them, is to abolish wasteful practices on the part of the carriers, and to prevent unreasonable discriminations and preferences as between shippers and receivers of freight.

He does not think that such objectives can be accomplished satisfactorily "by an attempt to blueprint and pinpoint the physical operations of the carriers within terminal areas"—the commission should not envision "a static condition in the industrial and transportation fields." On the contrary, Mr. Alldredge thinks that switching operations may be expected to increase in intricacy and complexity as communities and industries grow. "To meet this expanding need," he added, "ways and means must be found to keen within reasonable bounds the carriers' costs." And he does not think the adoption of formulas based upon operating practices has produced, or will produce, "constructive results."

Switching Economics—Thus Mr. Alldredge suggested a "more fundamental approach" which would embrace, among other things, cost data, including comparative costs of industrial and public team-track switching. In leading up to that suggestion, the dissenting commissioner had this to say:

"Many of the practices observed in switching service which appear to be excessive and wasteful on the surface may be, and frequently are, accomplished by compensating advantages and thus disappear completely when the services are equated in terms of cost. . . . It seems to me that it makes no difference how many switches are made a day so long as they are productive and are limited to the legitimate placing of cars for loading and unloading. For all we know, this practice may represent an effective and economical way for the carrier to utilize its facilities and labor. There is nothing in the law to limit a shipper's or consignee's right to only one switching service a day. So long as the request is reasonable it is within the law, and reasonableness in such circumstances depends upon the shipper's and consignee's needs as well as upon the carrier's ability to meet those needs."

Committee Approves Bill to Adjust Parcel Post Rates

Rate adjustments designed to ring the revenue from fourth-class mail, other than books and catalogs, into line with costs of the service are proposed in H. R. 2502, which has been reported favorably to the House from the committee on post offices and post roads. The committee report shows that for the year ended March 31, 1944, the revenue from the parcel-post business involved was $186,913,000, while the expenses totaled $200,262,000.

The rates proposed in the bill are set up to bring in $15,900,000 more in annual revenue than was realized from the rates in effect prior to March 26, 1944. As of that date the Revenue Act of 1943 increased parcel-post rates by three per cent, or one cent per package, whichever was greater, and the present bill would repeal that increase. The schedules proposed in the bill would fix, on packages weighing from nine to 12 ounces, rates ranging from eight cents for the first zone to 12 cents for eight zones. Parcels weighing 13 ounces to 70 pounds would bear rates ranging from 10 to 17 cents for the first pound, the range for each additional pound being from seven mills to 10.4 cents. The report compares these schedules with the rates in effect prior to the March 26, 1944, increase which it proposes to appeal. Those rates on parcels weighing from nine ounces to 70 pounds ranged from seven cents to 15 cents, the range for each additional pound being from five mills to 11 cents.

Decline in Carloadings Forecast by Trans-Missouri-Kansas Board

A decrease of freight car loadings of 0.9 per cent during the second quarter of 1945 and of 3.2 per cent during the third quarter as compared with the same periods during 1944 was forecast by the Trans-Missouri-Kansas Shippers Advisory Board when the executive committee met in joint session with the railroad contact committee at Kansas City, Mo., on March 20.

Second quarter estimates were for 416,290 car loads this year as compared with 420,317 during 1944. Increases of 2,362 cars of grain, 1,542 cars of grain products, 1,536 cars of lumber, 1,643 cars of forest products, and 7,109 cars of manufactured and miscellaneous products were estimated, while decreases of 1,100 cars of cement, 555 cars of clay products, 606 cars of iron and steel products, 1,909 cars of livestock, 3,637 cars of packing house products, and 10,589 cars of sand, stone and gravel were forecast for the period.

Jersey Central Warns Stone Throwers Face Prosecution

In the past two months, 20 Jersey Central trains have been stoned by youths at numerous points in New Jersey, and on March 22, E. T. Moore, general manager, issued a warning that the railroad would prosecute offenders to the limit of its resources. Mr. Moore said that "stones thrown through the window glass of our passenger coaches have caused injuries to 10 passengers in the last two months, and in one case a piece of glass lodged in a passenger's eye."

While the railroad realizes fully "that boys will be boys," and has been "reluctant to take what might be considered harsh steps for thoughtless, childish actions," it has issued this warning in the hope that no prosecutions will become necessary.

Equipment on Order

Class I railroads on March 1 had 37,166 new freight cars on order, according to the Association of American Railroads. On the same date last year, they had 33,012 on order.

This year's March 1 total included 5,985 hopper, 5,463 gondolas, 1,301 flat, 20,143 plain box, 1,586 automobile, 2,621 refrigerator, and 85 stock freight cars.

Class I roads also had 546 locomotives on order on March 1, compared with 779

on the same day in 1944. The former figure included 138 steam, two electric, and 406 diesel-electric locomotives compared with 264 steam, two electric and 513 diesel-electrics one year ago.

Class I roads put 8,384 freight cars in service in the first two months this year compared with 5,174 in the same period last year. Those installed in the past two months included 2,930 hopper, 1,061 gondola, 45 flat, 154 stock, 69 refrigerator, 408 automobile box, 3,717 plain box freight cars.

They also put 80 new locomotives in service in the first two months of which five were steam, and 74 were diesel-electric. New locomotives installed in the same period last year totaled 180, of which there were 75 steam, one electric and 104 diesel-electric.

Chesapeake & Ohio Proposes to Buy Steam-Turbine Locomotives

The Chesapeake & Ohio, on March 28, asked W. P. B. permission to build three coal-burning turbine-electric locomotives. The new locomotives will develop 6,000 hp. delivered from a steam turbine to generators and will be capable of running more than 100 miles an hour.

The Baldwin Locomotive Works already has completed the basic designs. C. & O. engineering personnel is collaborating with Baldwin in completion of design details. The steam turbine and electrical equipment are designed and will be built by the Westinghouse Electric & Manufacturing Company. The cab will be near the front end of the locomotive. The coal supply will be carried at the head end instead of in the tender, as at present. The boiler will take up the center section behind the engineman's cab. The steam turbine and electric generators, with a capacity of 4,000 kw., will be placed at the rear. Motors will be mounted on each of the driving axles.

"Experience with public utility, naval and merchant-marine power installations," says a statement signed by the three companies participating in the development of this locomotive, "has shown substantially greater reliability of steam turbine over Diesel engine power under sustained use, and our engineers are confident this new locomotive will confirm on rails the same superiority of performance. Moreover, ample engineering experience justifies our expectation that maintenance costs per 1,000 gross ton-miles hauled will be considerably less for this turbine-electric locomotive than for equivalent Diesel horsepower."

Carl E. Newton, president of the C. & O., in commenting on this project said: "We believe this locomotive marks a distinct technological improvement over all existing types of steam and Diesel road locomotives and that when put in operation it will prove to be fully competitive with any self-contained motive power now hauling trains on rails anywhere. In addition, it utilizes coal—the nation's cheapest and most abundant present and future source of energy.

"Each of the separate engineering elements combined in this new locomotive has been thoroughly proved. Therefore, while these locomotives will embody the most progressive applied engineering thought and nothing like them has ever been built before, we do not classify them as experimental. We are, in fact, building them for the specific purpose of powering separate sections of a projected new C. & O. streamline train which will be built as soon as critical materials and manpower become available."

I. C. C. Staff Appointments

Edmund W. Chapdelaine has been appointed assistant director of the Interstate Commerce Commission's Bureau of Traffic, and chief of the Section of Tariffs of that bureau. He succeeds Lorin C. Nelson, retired, the appointment becoming effective April 1.

Mr. Chapdelaine, who entered the service of the commission in 1914, has been assistant chief of the Section of Tariffs since 1930, and he has been in charge of special permission matters for the past 10 years. He will be succeeded by Ralph D. Hagerman, who has been junior assistant of the section.

Discontinues Case Involving All-Freight Rates to South

The Interstate Commerce Commission has discontinued its I. & S. No. 5283 investigation of railroad proposals to establish all-commodity rates from New York, Philadelphia, Pa., and Baltimore, Md., to Chattanooga, Tenn., and Birmingham, Ala., and from and to intermediate points. The case also involved any-quantity rates proposed "merely as a competitive measure" from New York, Philadelphia and Baltimore to points on the Central of Georgia over water-and-rail routes by way of Savannah, Ga.

The discontinuance came after the carriers had filed tariffs cancelling the schedules in issue. As noted in the *Railway Age* of August 26, 1944, page 349, Examiner G. H. Mattingly's proposed report had recommended that the commission condemn the proposed adjustments principally because they would have "such a seriously detrimental effect on the business of the boat lines as to constitute a real threat to their ability to resume operations."

B. & O. Victory Gardens

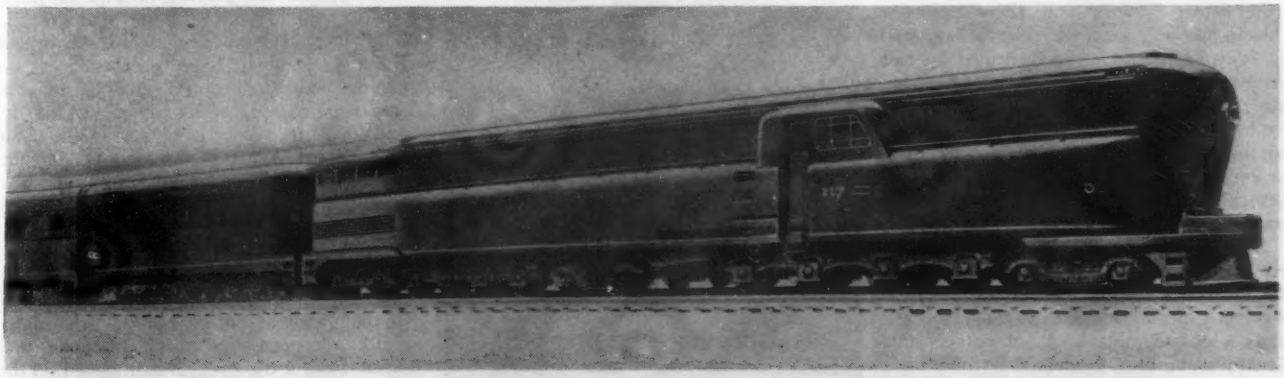
Indications are that Baltimore & Ohio victory gardeners will produce more foodstuffs in 1945 than in any of the three previous years, declared O. K. Quivey, manager of agricultural development, who said that already hundreds of employees have requested copies of the railroad's garden booklet.

In addition to plots which it will allot to employees who make application to their division superintendents along the right-of-way, the railroad will set aside at Baltimore, Md., Parkersburg, W. Va., Indianapolis, Ind., and Willard, Ohio, "demonstration" plots of about one acre in size, and will arrange to plow, disc and fertilize each plot, dividing it up into about 20 gardens to be worked by employees. B. & O. agricultural agents will be available at each point for consultation.

N. Y. C. Reveals Results of Sleeping Car Poll

From questionnaires distributed to thousands of sleeping car passengers aboard its leading trains (the 20th Century Limited, Commodore Vanderbilt, Advance Commodore, Southwestern Limited, Detroiter and New England States), the New York Central has found that two chief post-war demands predominate among this class of travelers—air conditioning and the convenience of private-room accommodations. In announcing results of the railroad's most recent poll, F. H. Baird, general passenger traffic manager, pointed out that the 160,000 answers received to individual questions represented an unsually broad cross-section of present war-time passenger traffic.

"Today," he said, "we are all out in our duty and obligation to the war effort, but we are planning for peace. This survey,



The Chesapeake & Ohio Proposed Steam-Turbine-Electric Locomotive Will Be Streamlined

conducted by an outside research group, offers one progressive way in which our post-war plans can be developed without lessening or interfering with our vital role in war transportation."

The greatest single contribution to modern rail-travel comfort, according to sleeping car passengers, is that of air-conditioning, and observed Mr. Baird, they have an especially high appreciation of individual air-conditioning and temperature control for each room.

An average of preferences of both men and women passengers revealed porter and other personal services to be second to modern sleeping equipment, the leading favorites among all types of present and proposed overnight accommodations being the new roomette and bedroom, and the proposed duplex roomette and duplex bedroom. Together, they won three times as many votes as the open-section lower berth, passengers exhibiting a decided preference for the privacy and convenience of individual rooms.

Ranked slightly higher by men than by women were dining and lounge car facilities, with the lounge-observation type club-cars edging out the mid-train type by a slight margin. Because of this emphasis placed on dining and lounge service, the New York Central shortly will conduct a special survey of these accommodations.

Railroad General Agents' Assn. of Los Angeles Formed

On March 16 there was formed, in the Marine Room of the Jonathan Club, Los Angeles, the Railroad General Agents' Association of Los Angeles. The new association is organized along the same principles as are those established in other cities, having as its aim the promotion of mutual interests and the fostering of a better understanding of the purposes of the traffic department and its value to the shipping public.

The following officers were elected for the ensuing year: President, David R. Evans (Chesapeake & Ohio—Pere Marquette); 1st vice-president, D. C. Wilkins (Western Pacific); 2nd vice-president, A. R. Anderson (Denver & Rio Grande); 3rd vice-president, L. G. Sills (Atchison, Topeka & Santa Fe); and, secretary-treasurer, C. W. Hoefener (Chicago, Burlington & Quincy).

Black Market in Space Denied at Hearing

Persistent rumors that there exists a "black market" in train reservations sold by railroad employees were denied by two railroad officers appearing as witnesses before a state Senate investigating committee held at Chicago on March 26. The two witnesses heard were S. W. Switzer, passenger traffic manager of the New York Central, and Edward P. Burke, passenger traffic manager of the Pullman Company.

Mr. Switzer, who steadfastly maintained his opinion that no such "black market" exists, revealed the fact that railroads serving Chicago had investigated the rumors a considerable time before the state Senate committee began its probe. He declared that the railroads had twice commissioned independent agencies—the Pinkertons and the Chicago Railway Audit Bureau—to investigate the charges and that in each instance the probes resulted in reports of "No irregularities."

Mr. Burke told a similar story and, in answer to questions, testified that after military demands for space and reservations are satisfied, the balance is given to civilians.

The hearing, which was brought about by a resolution steered through the Senate several weeks ago, will be continued on April 2.

To Reconsider Proposed Rates Adjusted to Lower Weights

The Interstate Commerce Commission has reopened, for reconsideration on the present record, the I. & S. No. 5271 proceeding wherein Division 2's report had authorized southwestern and southern railroads to increase their rates on liquefied petroleum gas, from producing points in the Southwest to destinations in the South, to compensate for a reduction in the estimated from 6.6 to 4.7 pounds per gallon. Division 2's report was noted in the *Railway Age* of October 21, 1944, page 632; its order is now suspended "until the further order of the commission."

The reduced estimated weight which prompted the rate-adjustment proposals involved in the present proceeding was established November 30, 1943, as required by the commission in *Green's Fuel Inc. v. Atlanta & St. A. B. Ry. Co.*, 251 I. C. C. 561.

Julius G. Luhrsen Confirmed for Retirement Board

The Senate on March 26 confirmed President Roosevelt's appointment of Julius G. Luhrsen to membership on the Railroad Retirement Board for the remainder of a five-year term expiring August 29, 1949. The nomination had been reported favorably from the committee on interstate commerce on March 23.

A sketch of Mr. Luhrsen's career appeared in the *Railway Age* of March 24, page 563. As noted there, he has been executive secretary-treasurer of the Railway Labor Executives Association and president-on-leave of the American Train Dispatchers Association which he founded. He becomes the labor representative on the Retirement Board, succeeding Lee M. Eddy, whose term expired August 29, 1944.

Julius G. Luhrsen

Upholds Ban on Indemnity Bonds by Partners

The Interstate Commerce Commission, Division 2, has found not unreasonable nor unduly prejudicial that provision of the Consolidated Freight Classification which prohibits delivery of a shipment to a consignee partnership in advance of the surrender of the bill of lading under an indemnity bond executed by members of the partnership. The report is in the No. 29062 proceeding which involves the complaint of Leo J. Drum and Charles E. Weisenburgh, copartners, engaged in the wholesale grain and feed business at Montgomery, Ala., under the firm name of Capital Grain and Feed Company.

Collision Follows Failure to Drop Lighted Fusees

A rear-end collision near Delphos, Ohio, involving two westbound passenger trains on the Pennsylvania's double-track main line from Pittsburgh, Pa., to Chicago on February 4 was caused by failure to provide flag protection for the preceding train and by failure to operate the following train in accordance with signal indication, the Interstate Commerce Commission has reported after an investigation under the supervision of Commissioner Patterson. Six passengers and 14 employees were injured.

The accident occurred about 7:20 p. m. in misting weather on practically level tangent track, where trains moving with the current of traffic were operated by signal indications. The signals in the territory were of the position-light type, automatic and semi-automatic in operation.

Passenger Extra 6110 had followed a freight train on the westbound track throughout a distance of about 16 miles immediately east of the point of the collision. In this distance it had stopped at 4 signals which displayed stop-and-proceed, and had made 3 additional stops in compliance with lighted fusees dropped by the flagman of the freight. It was preparing to stop in response to signals given by this flagman, and was moving about 5 m. p. h., when it was struck in the rear by the following train, passenger No. 43, which was moving about 10 m. p. h.

No. 43 had stopped at 2 signals displaying stop-and-proceed, which were 17,768 ft. and 10,597 ft., respectively, east of the point of the accident, and also had stopped at the station at Delphos, 1.77 miles east, and was moving with the throttle in drifting position at a speed not greater than 12 m. p. h., according to the enginemen, as it approached the point of the collision. Throughout a distance of about 1 mile east of that point of the view ahead was materially restricted by trailing smoke and steam from a train which had passed on the eastbound track, and the engineer of No. 43 had made a light service brake-pipe

News Department continued on second left-hand page

PULLMAN INCORPORATED

SUMMARY OF ANNUAL REPORT FOR 1944

Sleeping and Parlor Car Operations

In meeting the demand for long distance mass movement of troops in this country, Pullman in 1944 performed a total of 12.5 billion passenger miles of service in transporting troops in organized car and train movements. Approximately one-half of the Pullman-car fleet was continuously engaged throughout the year in this undertaking.

In the same period Pullman was called upon to perform 15.8 billion passenger miles of service in transporting individual service men, travelers on individual Government orders, and ordinary civilian patrons. These services together generated a total volume of 28.3 billion miles of passenger travel in Pullman cars in the year 1944, which was more than double the volume moved in the peak traffic year (1917) of World War I.

Manufacturing Operations

The $144 million of wartime production that streamed from our manufacturing plants in 1944 included wings and other assemblies for the Douglas C-47 planes employed in the D-Day invasion; heavy-gun carriages and transport mounts, shells, bombs and trench mortars for all the fronts; landing ships from whose holds men and equipment poured out on smoking beachheads; and patrol escort vessels that played a vital part in landing and convoy operations.

Pullman-Standard's reputation as a competent and versatile arsenal was further enhanced during 1944 by award of the Admiral Land Trophy, the highest honor in the Victory Shipbuilding Safety Contest sponsored by the Navy and the Maritime Commission.

Research and New Developments

The year has seen a continuation of technical research and development work in both major divisions of the business, insofar as war conditions have permitted the use of materials and labor. The immediate aim is to be prepared to produce railway freight and passenger equipment of the most advanced design and of the lightest possible weight consistent with proper strength requirements and at the lowest possible cost. Pullman-Standard has prepared an extensive series of models and pictured designs embodying much of this postwar planning work, for use in an exhibition entitled "Tomorrow's Trains Today" which has been shown in several railroad-headquarter cities and has attracted widespread interest among the forward-looking buyers of railway passenger equipment.

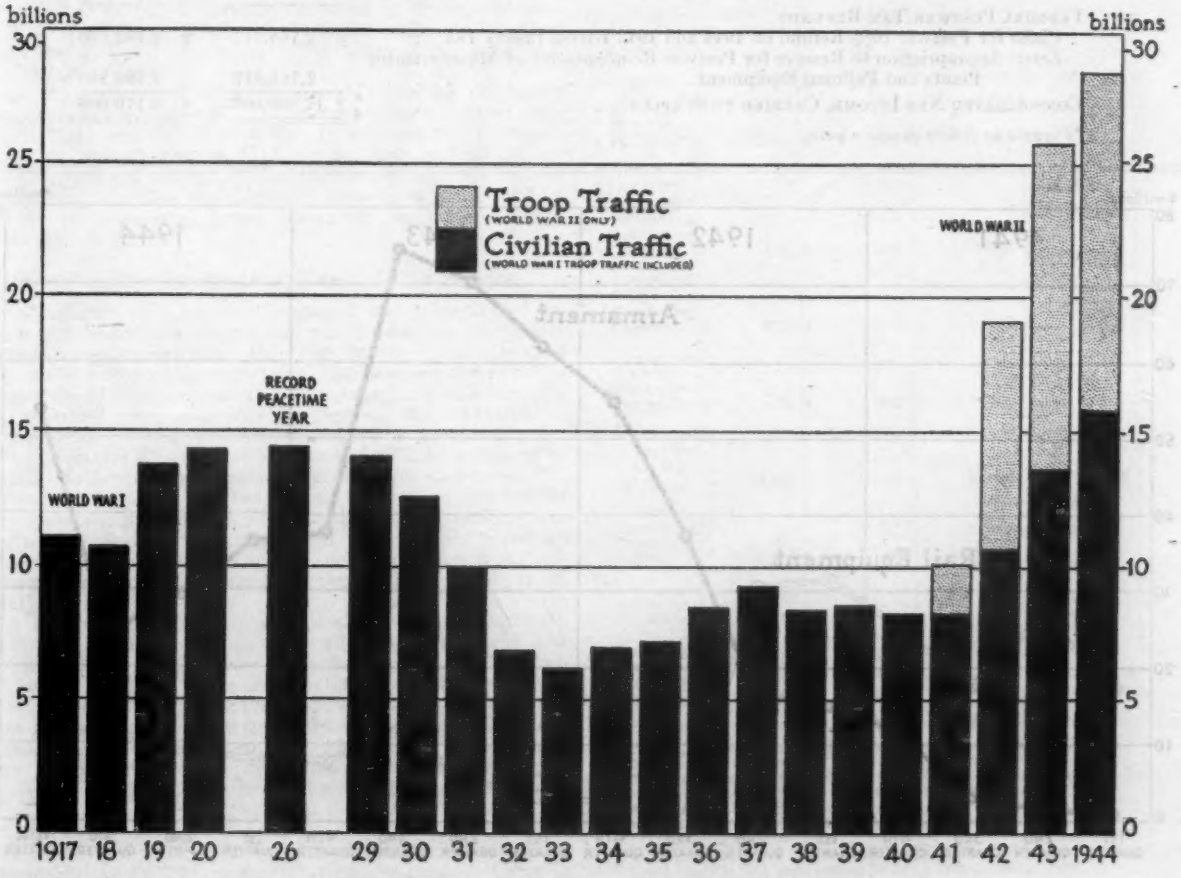
In December 1944, Pullman Incorporated completed acquisition of all the outstanding stock of The M. W. Kellogg Company of Jersey City, New Jersey, for many years a leading firm in the field of engineering and contracting for the petroleum and general chemical processing industries. In this connection reference is made to the announcement mailed to the stockholders of Pullman Incorporated under date of December 22, 1944, describing the general nature of the Kellogg Company's activities and indicating the possibilities of cooperation between that Company and Pullman-Standard in combining manufacturing capacity and in developing new products and processes.

Financial Condition

Reflecting principally the disbursement of $18,250,000 of cash in connection with acquisition of The M. W. Kellogg Company, the working capital of the consolidated group (not including that held in the Kellogg Company treasury) declined $1,831,466 to a total of $96,864,911 as of December 31, 1944. This working capital is equivalent to $29.99 per share of stock and accounts for something over one-half of the book net worth, which now amounts to $55.50 per share (not including any part of the $21,153,524, or $6.55 per share, of appropriated Surplus carried in reserve accounts).

Renegotiation of prices named in Pullman-Standard armament contracts with the United States Government covering shipments in the year 1943 has been completed resulting in a reduction of $10,719,411 in prices originally fixed for those shipments. After taking into consideration the applicable tax credits the renegotiation agreement called for a cash refund to the Government of $1,064,229, which was paid subsequent to the end of the 1944 fiscal year.

No provision has been made in the 1944 accounts for renegotiation of selling prices on 1944 armament shipments, but



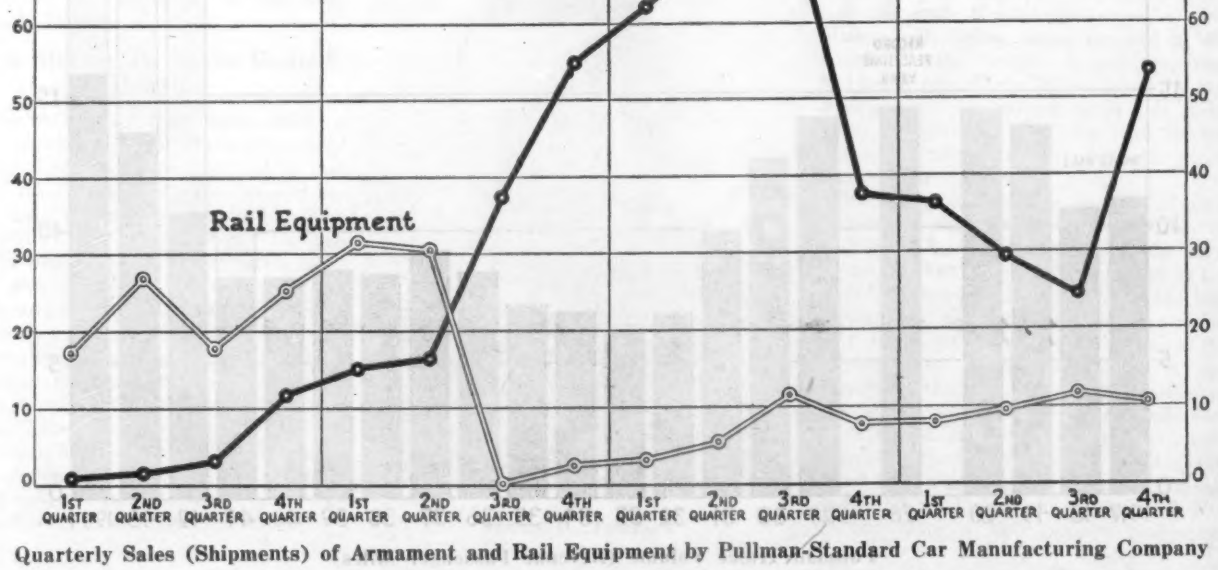
Pullman Traffic Volume (Revenue Passenger Miles)

CONSOLIDATED INCOME ACCOUNT

FOR YEARS ENDED DECEMBER 31, 1944 AND 1943

	1944	1943 (Note 1)
	(Cents Omitted)	
SLEEPING AND PARLOR CAR BUSINESS:		
Gross operating revenue	$165,692,599	$151,847,939
Less:		
Operating expenses (Note 2)	$110,898,200	$ 84,029,243
Provision for retroactive wage adjustment	692,750	5,962,595
Provision for depreciation	10,976,781	10,977,471
	$122,567,731	$100,969,310
	$ 43,124,867	$ 50,878,628
Less:		
Provision for contract revenue payments to railroads	$ 19,079,504	$ 26,887,573
Provision for Federal taxes on income (Note 3)	17,967,010	19,670,587
	$ 37,046,514	$ 46,558,161
	$ 6,078,352	$ 4,320,467
1942 Deferred Maintenance Reserve returned to 1944 Income	2,743,910	—
Net Carrier Earning	$ 8,822,262	$ 4,320,467
MANUFACTURING BUSINESS:		
Sales and miscellaneous revenues	$185,347,804	$262,922,882
Less:		
Cost of goods sold and operating expenses	$161,288,444	$241,322,573
Provision for retroactive wage adjustment	637,463	—
Provision for depreciation	1,999,839	1,995,953
Selling and administrative expenses	3,150,706	2,577,725
Interest, fees and expenses on VT Loan	243,780	118,071
Gain on manufacturing property sold	*157,896**	—
Provision for Federal taxes on income (Note 3)	14,547,779	12,828,215
	$181,710,118	$258,842,539
	$ 3,637,685	$ 4,080,343
Appropriation to Reserve for Manufacturing Contingencies	—	500,000
Net Manufacturing Earning	$ 3,637,685	$ 3,580,343
INVESTMENT OPERATIONS:		
Income from securities and miscellaneous items	$ 1,050,242	$ 939,970
Profit on securities sold	66,078	3,141
	$ 1,116,320	$ 943,111
Less: Miscellaneous income deductions	$ 37,420	$ 36,676
Administrative expenses of Pullman Incorporated	332,842	335,686
Provision for Federal taxes on income (Note 3)	316,000	295,552
	$ 686,262	$ 667,915
Net Investment Earning	$ 430,057	$ 275,196
	$ 12,890,006	$ 8,176,006
FEDERAL POSTWAR TAX REFUND:		
Claim for Postwar 10% Refund on 1944 and 1943 Excess Profits Tax	$ 2,764,517	$ 2,493,890
Less: Appropriation to Reserve for Postwar Re-adaptation of Manufacturing Plants and Pullman Equipment	2,764,517	2,493,890
CONSOLIDATED NET INCOME, CARRIED TO SURPLUS	$ 12,890,006	$ 8,176,006

**Figures in italics denote a gain.*



Quarterly Sales (Shipments) of Armament and Rail Equipment by Pullman-Standard Car Manufacturing Company

with lowered volume of war products and closer pricing the net cash refund to the Government after adjustment in the tax liability should be less than that now determined in the 1943 renegotiation.

Developments in Pullman Anti-Trust Case

On October 2, 1944 Pullman Incorporated elected to comply with the Court's requirement of "complete and perpetual separation" of the sleeping car business from the car manufacturing business, by disposing of all its interest in the sleeping car business and the properties used in connection therewith. At the same time there was filed with the Court as required a specific plan for effectuation of such separation, with recital of the offer of The Pullman Company, under date of August 30, 1944, to sell to the Railroads then being furnished with sleeping car service by The Pullman Company, the sleeping car business and all of the operating properties, with opportunity to take over the entire going operating organization.

Committees for each of the major railroad regions of the country (Eastern, Western and Southeastern) were formed promptly after August 30, 1944, under the auspices of the Association of American Railroads, to consider the position of the Railroads in each of these regions with respect to the provision of sleeping car service on their lines. No official reports by these regional railroad committees have as yet been made public, but it is generally understood that these committees have separately reached conclusion that the Railroads should not be called upon to undertake the operation of sleeping car service during the continuance of the existing wartime conditions.

In view of all the circumstances tending toward uncertainty as to period and method of effectuation, it has not been possible for The Pullman Company to make any definite progress with its offer to negotiate with the Railroads on the proposed sale to them of the Pullman sleeping car business . . . which we propose to carry out in good faith and as promptly as that can be accomplished with due regard for the public interest.

Personnel

The number of employes serving in the armed forces increased from 9,300 a year ago to 12,376 at the end of 1944, indicating that nearly a whole military division of Pullman employes is now engaged in service on battlefronts around the world. Ninety-six of them have made the supreme sacrifice, and hundreds have been wounded.

The number of people directly employed in Pullman's war-swollen transportation and manufacturing activities reached a new high of 61,368 (including 12,790 women) or more than double the 1940 total.

Wage payments for 1944 to employes (excluding executives and supervisors) averaged $2,453 per employe as compared with $2,273 in 1943 and $1,476 in 1940. In addition the Company incurred an average cost of $115 per employe in 1944 on account of payments under the Railroad Retirement and Social Security Act. In 1944 the Company also disbursed a total of $4,018,555 on account of group insurance, pension and other employe benefit plans.

Opportunities for Postwar Sleeping Car Service

With millions of Americans uprooted and transplanted by the demands of military service and war production, our people are more travel-minded today than ever before. Not only does it seem to be a reasonable expectation that wartime travel habits will continue after peace, but also that Americans will have the desire to travel more and more for pleasure and education.

Although an era of intensive competition for travel patronage is in prospect we believe that the demand will be sufficient to permit all well-conditioned travel agencies to register substantial gains in travel volume over the prewar level. The railroad industry including the attached Pullman sleeping car service, now has plans for developments which will make sleeper travel by rail more attractive than ever and help to maintain its advantages in comfort, convenience, dependability and—above all—safety in travel.

The Pullman plan for retirement from the sleeping car business proposes consolidation in Railroad ownership of the now separate and—in part at least—diverse interests of the Railroads and of Pullman in the transportation and accommodation phases of the sleeping car travel service. This would result in giving to that combined enterprise the benefit of an integrated handling of the vital rate-making function. It would also assure a continuity of operating opportunity that is a prerequisite for the large, long-term, new investment that can now be foreseen to be necessary to equip this service adequately to meet postwar competitive conditions.

The problem of reconversion, strictly defined, will be minor in Pullman-Standard's car manufacturing business. There a return to production of products needed in the peacetime operation of the Railroads can be accomplished almost immediately, inasmuch as the Company's War work has largely been done in plant facilities that were not being utilized for carbuilding prior to the War. There have been planned, however, large postwar expenditures at Pullman-Standard's active plants in order to better equip them for the most efficient production of modern types of freight and passenger cars. In turning the major attention of the Pullman passenger car plant at Chicago (Pullman Car Works) from shipbuilding, there will be a minimum of reconversion required, inasmuch as the major wartime changes there have been the installation of new Government-owned shipbuilding facilities which will not interfere with the return of that plant after the War to the job of building railway passenger equipment, for which it was primarily designed and especially adapted in the years just before the War. There is good prospect for large demand for product of that kind after the War, including extensive re-equipment of the sleeping car service of the country with the most modern types of sleeping car equipment, in which Pullman has specialized and led the field. . . .

THE PULLMAN COMPANY

Traffic and Operating Statistics

Comparative Statement for years Ended December 31

ITEM	1940	1941	1942	1943	1944
CARS OWNED	6,901	7,048	7,121	†7,749	‡8,336
CARS OPERATED	4,990	5,303	6,368	7,096	7,485
CAR MILES	820,386,700	878,057,274	1,071,254,181	1,222,676,452	1,326,580,210
REVENUE PASSENGERS:					
Berth	11,077,546	13,166,554	21,008,309	26,561,931	29,299,136
Seat	3,687,770	3,744,167	5,054,240	6,069,968	6,538,772
Total	14,765,316	16,910,721	26,062,549	32,631,899	35,837,908
REVENUE PASSENGER MILES	8,213,878,992	10,070,406,876	19,071,589,061	25,891,465,679	28,267,090,536
OPERATING REVENUE*	$ 60,143,649	$ 67,040,587	$ 99,722,785	$ 124,960,365	$ 146,613,094
Average per Car Operated	$ 12,052.84	$ 12,642.01	$ 15,659.99	$ 17,609.97	$ 19,587.59
EXPENSES**	$ 57,899,700	$ 65,307,638	$ 93,235,511 ***	$ 120,639,898	$ 137,790,832 §
Average per Car Operated	$ 11,603.16	$ 12,315.23	$ 14,641.25	$ 17,001.11	$ 18,408.93
NET CARRIER EARNING#	$ 2,243,859	$ 1,732,949	$ 6,487,273 ***	$ 4,320,467	$ 8,822,262
TRAFFIC AVERAGES:					
Average Operating Revenue per Passenger	$ 4.07	$ 3.96	$ 3.83	$ 3.83	$ 4.09
Average Net Carrier Earning per Passenger	$ 0.15	$ 0.10	$ 0.25	$ 0.13	$ 0.25
Average Net Carrier Earning per Car per Day	$ 1.23	$ 0.90	$ 2.79	$ 1.67	$ 3.23
Average Mileage per Car Operated	164,396	165,577	168,225	172,305	177,232
Average Journey per Passenger (Miles)	556	596	732	793	789
Average Miles per Car per Day	449	454	461	472	485
Average Loading per Car (Passengers)	10.01	11.47	17.80	21.18	21.31

* From all sources after deducting contract revenue payments to Railroads.
** Including allocated portion of Federal taxes on income.
*** After appropriation of $2,500,000 to reserve for postwar re-adaptation of Pullman equipment.
§ After credit of $2,743,910 covering 1942 Deferred Maintenance.
# After provision for Federal taxes on income.
† Including 626 special Government-owned troop cars installed late in 1943 and operated for Army Transportation Corps.
‡ Including 1,235 special Government- and Railroad-owned troop cars installed late in 1943 and yearly in 1944, and operated for Army Transportation Corps.

reduction. The valve of the steam heat line on the rear car of Extra 6110 was sufficiently open to permit a considerable volume of steam to escape, and this, together with the prevailing misty weather, obscured the marker lamps of the preceding train from the view of the enginemen on No. 43.

Although the rules required that a preceding train moving at less than normal speed should be protected with lighted fusees, the crew of No. 43 observed no fusees or other flagging signal in the 5.5 miles east of the point of the collision. The commission's report pointed out that the conductor of Extra 6110 had assigned the flagman of that train to duties which required him to be in the front portion of that train during the time when it was following the freight for 16 miles, and that the conductor, who was in the rear car, was familiar with the rule with respect to fusees, of which there was an ample supply in that car. "However," it observed, "no fusees were dropped at any point in this territory."

Concluding, the report commented as follows: "If lighted fusees had been dropped, the following passenger train would have been required to stop and extinguish any lighted fusee, then to proceed prepared to stop short of a train or an obstruction, and this accident would have been averted."

Norfolk & Western Locomotives

The Norfolk & Western has issued a plastic-bound booklet, with cover in colors, descriptive of its modern coal-burning steam locomotives, "modern" being used to designate those locomotives with high-capacity boilers, with roller bearings on all engine and tender wheels, one-piece cast-steel bed frames, improved counterbalancing, and complete mechanical and pressure lubrication. The locomotives described in the booklet are of three types: (1) a streamline passenger locomotive, Class J, with a 4-8-4 wheel arrangement; (2) a single-expansion articulated freight and heavy passenger locomotive, Class A, with a 2-6-6-4 wheel arrangement, and (3) a heavy Mallet compound freight locomotive, Class Y6, with a 2-8-8-2 wheel arrangement. Each of these types is illustrated and data are given on the performance, maintenance cost, fuel economy, and utilization.

Would Carry Truck-Forwarder Rates Past Present Deadline

Chairman Lea of the House committee on interstate and foreign commerce has introduced H. R. 2764 to provide for continuance beyond the present May 15 deadline of joint rate arrangements between forwarders and motor carriers. The present section 409 of Part IV of the Interstate Commerce Act fixes that limit on the period allowed forwarders to change over from such joint-rate arrangements to the use of assembling and distribution rates published by the carriers.

The Lea bill would set no new deadline date, but would permit the present arrangements to remain in effect until the Interstate Commerce Commission shall have determined as a matter of permanent policy the terms and conditions under which forwarders may utilize the services and instrumentalities of motor carriers. Under the bill's terms the commission could sanction permanent joint-rate arrangements, prescribe other arrangements, or find that the situation will be adequately met by assembling and distribution rates.

Freight Car Loading

Loadings of revenue freight for the week ended March 24 totaled 816,058 cars, the Association of American Railroads announced on March 29. This was an increase of 269 cars, or .03 per cent above the preceding week, an increase of 38,480 cars or 4.9 per cent above the corresponding week last year, and an increase of 28,718 cars or 3.6 per cent above the comparable 1943 week.

Loading of revenue freight for the week ended March 17 totaled 815,789 cars, and the summary for that week as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loading

For the Week Ended Saturday, March 17

District	1945	1944	1943
Eastern	167,828	157,001	157,720
Allegheny	182,755	175,292	172,833
Pocahontas	52,714	54,550	56,482
Southern	129,678	127,051	122,895
Northwestern	83,241	84,568	72,376
Central Western	125,914	117,760	116,137
Southwestern	73,659	68,973	69,691
Total Western Districts	282,814	271,301	258,204
Total All Roads	815,789	785,195	768,134
Commodities			
Grain and grain products	44,067	44,958	43,140
Live stock	14,335	14,587	12,517
Coal	169,570	168,099	173,612
Coke	15,400	15,140	14,958
Forest products	41,905	45,547	40,154
Ore	17,080	13,693	17,312
Merchandise l.c.l.	108,380	106,110	98,829
Miscellaneous	405,052	377,061	367,612
March 17	815,789	785,195	768,134
March 10	766,290	780,265	769,045
March 3	785,264	786,893	748,926
February 24	771,843	780,984	782,921
February 17	783,738	774,237	752,019
Cumulative Total, 11 Weeks	8,418,584	8,665,169	8,252,468

In Canada.—Carloadings for the week ended March 17 totaled 68,313, as compared with 69,105 for the previous week and 69,635 for the corresponding period last year, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
March 17, 1945	68,313	40,885
March 18, 1944	69,635	42,244
Cumulative Totals for Canada:		
March 17, 1945	714,410	402,325
March 18, 1944	746,423	434,354

Representation of Employees

The Brotherhood of Railroad Trainmen has been chosen as the Railway Labor Act representative of Denver & Rio Grande Western yardmasters, according to results of a recent election which has been certified by the National Mediation Board. The yardmasters were previously unrepresented, and the Railroad Yardmasters of America invoked the services of N. M. B., only to lose out to the B. of R. T. by a vote of 27 to 20.

In another recent election, Patrolmen's Association, Chicago Great Western Railway, defeated the American Federation of Labor's National Council of Railway Patrolmen's Unions, and extended its coverage of C. G. W. Police Department employees to include watchmen and guards as well as patrolmen. The Congress of Industrial Organizations' United Railroad Workers of America won three recent elections on the Texas Electric, thus becoming the representative of that road's motormen, shopmen, and maintenance of way employees. The first two groups were previously unrepresented, but in the maintenance employees case the C. I. O. union supplanted the Brotherhood of Maintenance of Way Employees.

Cook's Reappointment to N.M.B. Confirmed by Senate

President Roosevelt's reappointment of George A. Cook to membership on the National Mediation Board for a new term expiring February 1, 1948, was confirmed by the Senate on March 26, having been reported favorably from the interstate commerce committee on the 23rd. A former secretary of the board, Mr. Cook has been a member since 1938.

International Air Express Shipments Rise

A total of 22,616 international air express shipments, with outgoing air traffic exceeding incoming commodities almost three to one, was handled by the Air Express Division of Railway Express Agency in February. This, the company said, was an increase of 36 per cent over the comparable 1944 period.

Charges paid by shippers on this traffic amounted to $84,760. In February, 1944, the figure was $52,590.

Contracts of Contract Carriers By Water

The Interstate Commerce Commission, Division 1, has extended from April 2 until May 2 the deadline date for the filing of verified statements and briefs in the Ex Parte No. 161 investigation which the commission instituted February 10 to determine whether contract carriers by water should be required to file copies of their contracts, charters or agreements with shippers. As noted in the *Railway Age* of February 24, page 396, the verified statements and briefs may include requests for public hearing or oral argument.

February Freight on C. P. R. Reaches All-Time High

Despite the most adverse weather encountered in many years, a new all-time high in movement of revenue freight traffic over its eastern lines was established by the Canadian Pacific during February. In announcing the record movement of 393,226 loaded revenue cars, D. C. Coleman, chairman and president, said that the highest daily figure was set on February 24, when 15,404 cars were handled.

Explaining that the record handling "was not without its difficulties," Mr. Coleman said, however, that the C. P. R. had been able to maintain current movement of supplies, both import and export, and that during the month 3,500,000 bu. of grain

had been delivered to St. John (N. B.) for transport overseas. "What the public may not have realized," Mr. Coleman pointed out, was that to make possible such movement, railway workers "battled blizzard and cold as low as 50 deg. below zero," and it was necessary for the railroad's snow plows to travel 55,776 miles during the record month.

The C. P. R. president added further that in addition to its own movement, his company had handled a substantial amount of traffic diverted from both Canadian and United States railways, with many freight loads being diverted to Canadian Pacific lines at Sault Ste. Marie, Windsor, and other points, because of tie-ups during the recent heavy snows.

Railroads Need 80,000 Workers

In a recent report of personnel needs and surpluses in the railway industry as of February 1, 1945, the United States Railroad Retirement Board surveyed about 84 per cent of the Class I railroads employing approximately 74 per cent of the total employees in the industry. These 192 railroads reported total man-power needs of 80,715 and total surpluses of 40 men. The occupations where the needs amounted to more than 1,000 men were as follows:

Brakemen	2,457
Bridge and building helpers	1,023
Carmen	3,131
Carman helpers	1,380
Carpenters	1,103
Bridge and building carpenters	1,004
Freight handlers	3,787
Helpers	2,410
Miscellaneous laborers	1,480
Shop laborers	3,867
Machinists	3,366
Machinist helpers	1,442
Switchmen	2,994
Telegraphers	1,392
Extra gang men	6,682
Section laborers	21,264

The Pacific Coast area needs were reported as 12,682, the Northwest area as 9,319, the Southwest as 12,673, the Southeast 10,039, the Middle West 20,061, and the East and New England 15,941.

Alleghany Proposes Plan to Retain C. & O. Control

The Alleghany Corporation has asked the Interstate Commerce Commission to consider certain proposals "with a view to the possible disposition of these proceedings without litigation" in lieu of exceptions to the proposed report of C. E. Boles, assistant director of the Bureau of Finance, recommending that the commission should find that Alleghany's control of the Chesapeake & Ohio and its affiliates, the Pere Marquette and New York, Chicago & St. Louis, was acquired and is maintained in violation of section 5(4) of the Interstate Commerce Act.

In acknowledging these proposals, which took the form of a letter from Allan P. Kirby, president of Alleghany, to W. P. Bartel, secretary of the commission, Mr. Bartel indicated that they would receive "prompt consideration." Meanwhile, the limit for the filing of exceptions has been extended to May 5. The letter indicated that Alleghany would file exceptions in the normal way if the commission should decide that the proposals are not a "proper basis for terminating the proceedings."

According to Mr. Kirby, it is Alleghany's intention to "acquire or dispose of" securities of other corporations from time to time, including those of carriers subject to I. C. C. regulation. "It is, however, Alleghany's intention to limit its control of such carriers to the Chesapeake & Ohio Railway Company and its affiliated carriers so long as such control continues and subject, of course, to the right of Alleghany Corporation to apply to the commission for control of such other carrier or carriers as may be in the public interest."

Alleghany would be prepared to accept a commission order, according to Mr. Kirby, "authorizing continuance of its control" of the C. & O. under these conditions:

1. Alleghany would be subject to such provisions of section 5(3) of the act as the commission should deem appropriate. (This apparently would effectuate commission control of Alleghany's financial transactions.)

2. Alleghany's voting stock of the Pittston Company would be deposited with the Manufacturers Trust Company under a voting trust agreement under which the trustee would vote the stock independently in elections of directors, but would vote as Alleghany directed on a merger or other proposal submitted for stockholder approval which would affect the investment value of the stock. Any voting stock of any other carrier except the C. & O. roads which Alleghany may hereafter acquire would be deposited in the same way. Such stock would be subject to release for sale to anyone not affiliated with Alleghany, for ratable distribution to Alleghany stockholders, or under I. C. C. order.

3. The C. & O. would dispose of its Pittston and Erie voting stocks either by distribution to its stockholders or by deposit with the Chase National Bank under a voting trust arrangement similar to that described above. Mr. Kirby said that Alleghany was "informed" the C. & O. would be prepared to accept these conditions.

If the commission should consent to these proposals, Mr. Kirby said, "it would be expected that the investigation proceedings in Docket No. 29085 would be dismissed or discontinued without adjudication on its merits." It was in this proceeding that the proposed report was issued, as noted in *Railway Age* of March 10, page 460, recommending that the commission should afford the parties—that is, Alleghany, the C. & O., Mr. Kirby and Robert R. Young, the latter two being involved through their control of Alleghany—an opportunity to make suggestions as to action to be taken to divest Alleghany of control of the railroads before it enters an order terminating the "violation" of the act.

A. A. R. Member Road Meeting

"Equipment Needs of the Railroads" is the principal subject scheduled for the meeting of Association of American Railroads member roads to be held at the Hotel Stevens, Chicago, on April 4. The A. A. R. board of directors also will meet there on the 3d.

Supply Trade

The **Pacific Car & Foundry Co.'s** Billings, Mont., plant has been awarded the Army-Navy "E" for excellence in the manufacture of war materials.

At his own request, **Henry F. Pope,** chairman of the board of the **National Malleable & Steel Castings Co.** since 1934, was not re-elected to that post at the annual meeting on March 28 and the office of chairman was left vacant. Mr. Pope

Henry F. Pope

will continue as a director. He has been active in the company since he began as an office boy with its predecessor, the Cleveland Malleable Iron Company, in 1884, and has served in various capacities including those of assistant treasurer, vice-president and president. He has been a director since 1899. **W. H. Moriarty,** assistant to the president responsible for the direction of general policies and coordination between the five plants of the company for all industrial sales, had been

W. H. Moriarty

assigned the additional duties of assisting in the administration of the railway sales department.

R. W. Higgins, assistant comptroller of the **Pullman-Standard Car Manufacturing Company,** Chicago, has been promoted to comptroller, succeeding to the duties of **H. M. Dudley,** who has been re-

elected vice-president. **G. C. Thiele,** assistant to the comptroller, has been advanced to assistant comptroller, replacing Mr. Higgins.

G. D. Thompson, chairman of the board of directors of the **Pittsburgh Steel Foundry Corporation,** Glassport, Pa.,

G. D. Thompson

has been elected president of the company. Mr. Thompson has been a director of the company for the past six years. He was elected chairman in 1942. He attended the Carnegie Institute of Technology and was at one time connected with the Westinghouse Electric & Manufacturing Co. as a production manager. Subsequently, he was president of the Thompson & Taylor Co., which specialized in problems of corporate and financial management, and president of the 535 Fifth Avenue Corporation.

Alfred B. Egan has been appointed district manager, Chicago district, of the **Sheffield Steel Corporation.** Mr. Egan has been in charge of the company's Washington, D. C., office since 1942.

The **American Foundry & Equipment Co.,** Mishawaka, Ind., has been awarded a third white star to add to its Army-Navy "E" flag for continued outstanding achievement in producing materials essential to the war effort.

Waldo E. Bugbee has been appointed exclusive representative of the **American Hoist & Derrick Co.** for the sale of American railway equipment to railroads in Texas, and to railroads operating out of New Orleans, La., and St. Louis and Kansas City, Mo.

R. D. Parsons has returned to the Chicago district office of the **ACF-Brill Motors Company** as sales representative. Since the outbreak of the war, Mr. Parsons has been located at the ACF-Brill Philadelphia, Pa., plant, most recently as manager of the planning department.

Robert E. Briggs, assistant shop engineer, has been appointed shop engineer of the **Lima Locomotive Works** to succeed the late W. N. McConkey, **Ivan B. Wagner** has been appointed senior assistant shop engineer and **Henry Wagner, Jr.,** assistant shop engineer. Mr. Briggs was graduated from Ohio State University in 1934. He formerly was employed with the Packard Electric division of the General Motors Corporation, Warren, Ohio, and was process engineer there when he resigned in 1937 to become industrial engineer at the Berger Manufacturing division of the Republic Steel Corporation, Canton, Ohio. He was appointed plant engineer in 1940, holding that position until 1942 when he joined the Lima Locomotive Works as assistant shop engineer. Mr. Ivan Wagner has been in the electrical department of the Lima Locomotive Works for the past 28 years and has been chief electrician for 19 years. Mr. Henry Wagner, Jr., was employed with the American Locomotive Works at Pittsburgh, Pa., before joining the Lima shop engineering department 28 years ago.

E. D. Cowlin has been appointed resident manager of the Reliance division of the **Eaton Manufacturing Company,** Massillon, Ohio, and will assume local supervision of manufacturing and sales operations as well as all of the activities in connection with the conduct of the Reliance division's local operations in Massillon. Mr. Cowlin has been associated

E. D. Cowlin

with the company for 21 years. He originally was in charge of the New York office and, in 1930, he was transferred to the Massillon office as general sales manager. He is a past president of the National Railway Appliance Association and, at present, is chairman of the relations committee of the board of directors. He is a member of the American Railway Engineering Association, the National Federation of Sales Executives, the Society of Mechanical Engineers, the Canadian Railroad Club and the Farm Implement Auxiliary.

The **Gould Storage Battery Corporation,** Depew, N. Y., has contracted with the **Pressed Steel Car Company** of Pittsburgh, Pa., for the latter to act as exclusive agent for the export of Gould industrial storage batteries in all parts of the world except Canada.

L. C. Chase & Co. has been consolidated with the Goodall decorative fabrics division of the **Goodall Company,** to be known as **Goodall Fabrics.** The following appointments have been announced: **Paul E. Carr** has been appointed general manager. Mr. Carr joined L. C. Chase & Co. in 1940 as manager of the woolen division and for the past two years has been assistant general manager. **George B. Ogan** will continue with the company in a consulting capacity. **Jud E. Williams** has been appointed sales manager. Mr. Williams has been general manager of the Goodall decorative fabrics division since 1940. **John J. Dacey, Jr.,** has been appointed advertising manager. Mr. Dacy has been with the Goodall Company clothing division for four years in the sales and advertising departments.

OBITUARY

Bert B. Quillen, president of the Cincinnati Planer Company, Cincinnati, Ohio, died February 26.

Equipment and Supplies

LOCOMOTIVES

The CENTRAL OF NEW JERSEY has begun tests of a 2,000-hp. Baldwin-Westinghouse Diesel-electric locomotive on various passenger trains. For six days, the locomotive will be used on a variety of runs in the mainline and seashore suburban territory, and on one round trip between New York and Mauch Chunk, Pa. William Wyer, chief executive officer of the railroad, said that the road had no present plans for the purchase of new passenger locomotives, but decided to make the tests in order to gain the possible future benefit of first-hand experience with this type of Diesel.

As reported in the *Railway Age* of March 10, the PENNSYLVANIA has ordered 50 multi-cylinder steam locomotives, capable of pulling full-length passenger trains at speeds up to 100 miles per hour, and freight trains on fast schedules. Twenty-five engines will be built by the Baldwin Locomotive Works, and twenty-five engines and fifty tenders in the Altoona, Pa., shops of the railroad. The new locomotives will go into service this year.

Known as class T1, the new locomotives will be used on the Pennsylvania's main steam lines west of Harrisburg, Pa. They are designed materially to increase the efficiency and economy of operation in through passenger and freight service. Two T1 engines already have been built and have been in use for some time.

Pennsylvania officers have stated that the new engines will exert pulling power on a standing train approximately 45 per cent greater than that of the road's present heavy duty passenger locomotive, with pulling power more than twice that of present locomotives at speeds above 55 m. p. h. In the freight service the new engines will provide materially increased pulling power at higher speeds.

The T1 engine is the fourth newly designed type of coal-burning steam locomotive to be announced recently by the Pennsylvania. The others include a multi-cylinder, heavy duty locomotive, class Q2, now also being built in quantity; a steam turbine locomotive, type S2, recently completed and

News Department continued on next left-hand page

TO *Increase* FREIGHT CAR AVAILABILITY

LIMA Steam Locomotives, by enabling railroads to maintain faster freight schedules, do more than cut down delivery time that may be vital to the war effort. They also greatly increase freight car availability by reducing the hours between loading point and destination.

Although the need of getting maximum service from every freight car is spotlighted by wartime emergencies, it always will be a vital factor in successful railroading.

LIMA LOCOMOTIVE WORKS

LIMA LOCOMOTIVE WORKS INCORPORATED

INCORPORATED, LIMA, OHIO

placed in test service; and the recently announced "Triplex" steam turbine locomotive. The new T1 locomotives will have eight driving wheels driven by four cylinders. Each pair of cylinders will power two pairs of driving wheels. There will also be four-wheel leading and trailing trucks. The tender will carry 41 tons of coal and 19,500 gal. of water. The T1 engines will be equipped with poppet valves.

The Pennsylvania now has in service and on order eighty multi-cylinder engines that, in addition to other advantages, provide smoother power than the conventional two-cylinder locomotive. Further, the second pair of cylinders on these locomotives permits the use of lighter driving and connecting rods, reducing friction, wear, and maintenance.

Completely streamlined, the T1 engines, with tenders, will be approximately 123 ft. long, 15½ ft. high, and will weigh 930,200 lb. in working order. Driving wheels will be 80 in. in diameter, steam pressure 300 lb. to the square inch, and starting tractive effort 64,500 lb.

FREIGHT CARS

The Bangor & Aroostook is inquiring for 50 to 100 hopper cars of 70 tons' capacity and 50 to 100 rack cars of 50 tons' capacity.

The Canadian National has ordered 500 40½-ft. steel sheathed wood-lined box cars of 50 tons' capacity from the Eastern Car Company.

SIGNALING

The Chicago, Burlington & Quincy has placed an order with the Union Switch & Signal Co. for signal material involved in the installation of centralized traffic control on 142 miles of single track between McCook, Neb., and Akron, Colo. Besides the control machine which will be located at McCook, the order includes the office and field coding units, Style H-2 searchlight high and dwarf signals, Style M-22B dual-control electric switch layouts, Style SL-6A electric switch lock layouts, and relays, rectifiers, and transformers. The field installation work will be carried out by the railroad company's regular forces.

* * *

Know What This Means?

More Than a Million Veterans of the Armed Forces Are Now Entitled to Wear the Honorable Discharge Service Button, Reproduced Above

Construction

Kansas City Southern.—This railroad has awarded a contract, amounting to $43,000, to the National Boiler Washing Systems, Chicago, for the construction of a boiler washing plant at Shreveport, La. The project will include installation of a 20,000-gal. washout tank, a 30,000-gal. filling tank, the necessary piping and electric pumps with push-button automatic control to serve 16 stalls in the roundhouse and seven outside tracks.

Louisville & Nashville.—Division 4 of the Interstate Commerce Commission has authorized this company to acquire a private railroad of the Clover Splint Coal Company from Golva, Ky., to Clover Fork, 2 miles, and to build a 9-mile extension thereto to afford rail service to a coal mining area on Clover Fork. Cost of the acquisition and rehabilitation of the coal company's road is estimated as $249,893, while the cost of the new line is estimated as $1,265,020, all of which is to be paid from the road's treasury. The line will be laid with 100-lb. rail and bridges and other structures will be permanent. The ruling grade will be 1.34 per cent against empty car movement. The maximum rate of curvature will be 9 deg.; the average, 128 deg. per mile. The work is required to be completed by November 1, 1946.

Minneapolis, St. Paul & Sault Ste. Marie.—As part of its improvement program, this road has awarded three contracts covering work as follows: replacing 390 ft. of approach trestle at Gills Landing, Wis., $50,000; rebuilding a bridge at Moose Lake, Minn., $25,000; and fill for portion of a bridge at New Brighton, Minn., $45,000.

Union Pacific.—This road has awarded a contract, amounting to $50,000, to the McCormack Construction Company, Pendleton, Ore., for the construction of a rooming and eating house at Ayer, Wash. The building, which will be for the exclusive use of Union Pacific workers, will contain locker rooms, wash and toilet rooms, manager's quarters, approximately 40 bedrooms for trainmen and restaurant and kitchen facilities.

Abandonments

More Employee Protection Cases Presented by Unions

The Interstate Commerce Commission has been asked by the Railway Labor Executives Association and certain individual railway unions to prescribe specific conditions for the protection of employees who may be adversely affected by various line abandonments authorized in 1943, or in lieu thereof to extend for a further period of two years its reservation of jurisdiction with respect to such protection. The petitions suggested that the conditions set forth in the Burlington case, 257 I. C. C. 700, be prescribed in the proceedings involved, namely, Nos. 13773 (Atchison, Topeka & Santa Fe), 13799 (Union Pacific), 14017 (Nashville, Chattanooga & St. Louis), 14025 (Chicago, St. Paul, Minneapolis & Omaha) and 14044 (Louisiana & Arkansas). The R. L. E. A. asked permission to intervene in those proceedings to which it had not previously been a party, and its petitions were supported by the Brotherhood of Locomotive Firemen & Enginemen (in Nos. 13773, 14017 and 14025), the Order of Railway Conductors (in No. 13773), the Order of Railroad Telegraphers (in No. 13773), and the Brotherhood of Maintenance of Way Employees (in No. 13799).

Grand Trunk Western.—This road has applied to the Interstate Commerce Commission for authority to abandon two Michigan lines totaling more than 73 miles in length. They are between Cass City, Caseville, 24.9 miles, and between Greenville and a point 4.19 miles east of Muskegon station, 49.08 miles.

Red River & Gulf.—This road has applied to the Interstate Commerce Commission for authority to abandon its line from Long Leaf Junction, La., to Bliss, 9.13 miles, and to abandon operation on a line of the Crowell Long Leaf Lumber Co. from Bliss to Kurthwood, 39.58 miles.

Financial

Akron, Canton & Youngstown.—*Akron Group Wins Control.*—The Akron (Ohio) management group became the victor last week in a fight for control of the Akron, Canton & Youngstown after election judges submitted their report following a four-day legal study of the validity of proxies. The report showed 18,247 proxies for the management group headed by H. B. Stewart, Jr., president of the road, and 17,686 for the opposition, which is headed by D. W. Hornbeck, of Cleveland, Ohio, president of the National Bronze & Aluminum Co.

The following directors were elected:

Management's choice—J. R. Wilkerson, road vice-president; H. E. White, Cleveland Trust Co.; J. P. Seiberling, president of Seiberling Rubber Company; N. R. Mitchell, road secretary; George Hagenbuch, Cleveland banker; K. H. Suder, an executive of the A. C. & Y.; A. C. Blinn, Ohio Edison Co., chairman, and Mr. Stewart.

Hornbeck's choice—C. Philip Lowe, New York financier; J. A. M. Thomas, Boston investment dealer; W. I. Neimeyer, National Bronze vice-president; A. E. R. Schneider and Henry Tremmel, Cleveland business men; Mr. Ewing, former Cleveland jurist, and Mr. Hornbeck.

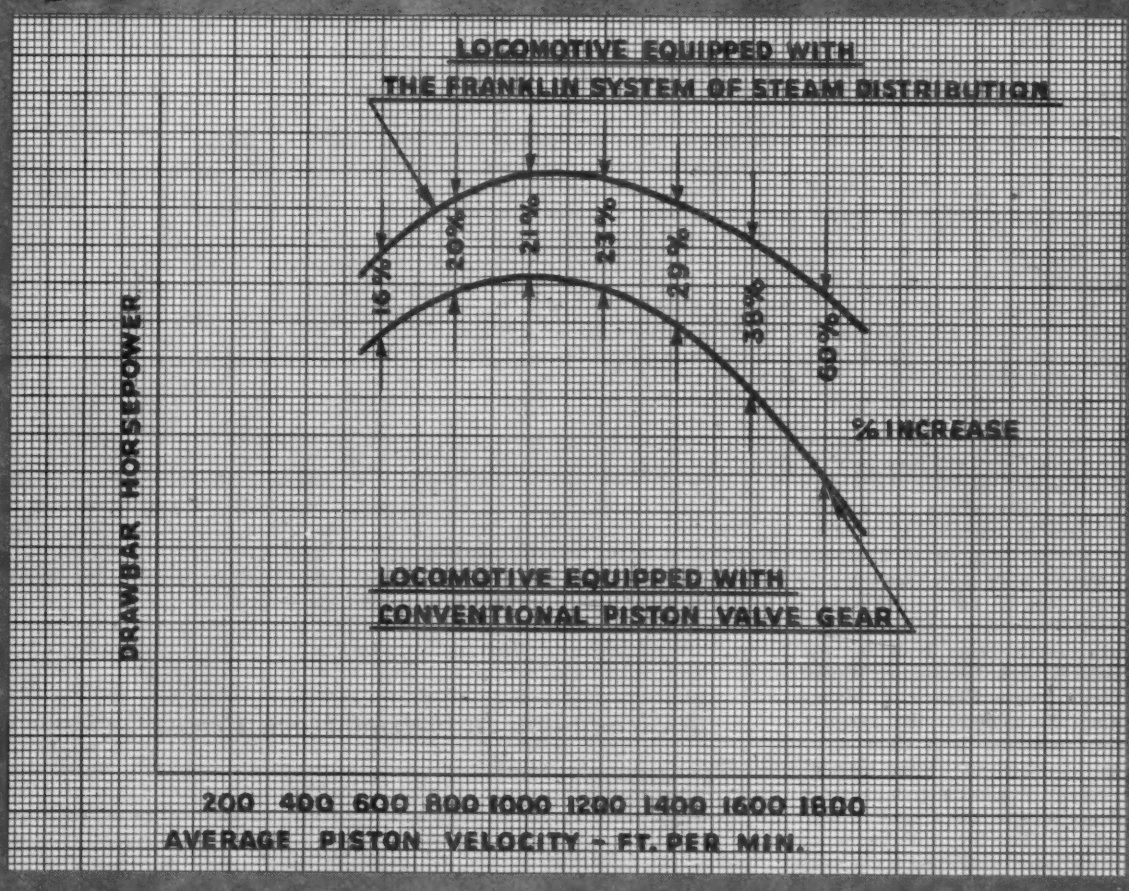
Boston & Maine.—*Annual Report.*—In its 112th annual report, the Boston & Maine states that its twelve new Diesel-electric locomotives hauled 506,891,000 tons of freight the equivalent of one mile in December, 1944, at a cost of about $80,000 less than it would have cost to haul this freight with steam locomotive power. Three new all-time operating efficiency records were produced by the railroad last year.

News Department continued on next left-hand page

Increase in Drawbar Horsepower

obtained with
typical application of

THE FRANKLIN SYSTEM of STEAM DISTRIBUTION



Both curves are established on the basis of the same amount of steam to the cylinders. The Franklin System assures a substantial increase in horsepower output and economy, for either passenger or high speed freight service.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.
NEW YORK • CHICAGO
In Canada: FRANKLIN RAILWAY SUPPLY COMPANY, LIMITED, MONTREAL

These were in gross tons per train; train-miles per train-hour; and gross ton-miles per train-hour.

Freight revenue in 1944 amounted to $60,205,568, an all-time high for the road. While the revenue tons of freight handled was 1.6 per cent below 1943, an increased percentage in the movement of finished goods, as compared with bulk commodities, produced the high revenue. Anthracite tonnage was the greatest since 1930, and though the number of cars handled was less than in 1942, heavier car loading brought the tonnage to slightly in excess of the 1942 figure and about 9 per cent above 1943.

"The movement of petroleum products through our western gateways declined from 131,509 cars in 1943 to 113,373 cars, or 16 per cent," the report states. "All-rail bituminous coal dropped from 48,960 to 40,047 cars, or 18 per cent. This was caused by an increase in the return of bituminous coal to water movement from Hampton Roads to New England ports." During 1944 the Boston & Maine carried a total of 987,410,434 passengers, producing passenger revenue for the year amounting to $19,532,662, an increase of 2.7 per cent over 1943, and the highest passenger revenue since 1926.

During 1944, the Boston & Maine reduced its long term debt, including equipment trust obligations, by $4,019,325, leaving a balance of $106,663,874 outstanding in the hands of the public. A summary of debt retired and applied against the $25,000,000 debt retirement provision of the company's mortgage shows that the total retired up to December 31, 1944, was $22,873,200.

CHESAPEAKE & OHIO.—*Annual Report.*—In his letter to stockholders prefacing the 67th annual report of the Chesapeake & Ohio, C. E. Newton, president, highlights the purpose and policy of the road's management to meet its competition by contributing to the development of improved and more efficient technology, designs and methods. Mr. Newton cited three steam-turbine-electric locomotives, of a new and revolutionary design, being built for the C. & O. by the Baldwin Locomotive Works and the Westinghouse Electric & Manufacturing Co. He said that the company in 1944 also sponsored with eight other railroads the development by the General Electric Company of a locomotive having a boiler of radically new type and other progressive features. Together with five other railroads and three coal producers, the C. & O. joined in supplying an initial fund for a long-range program of fundamental research to develop a more efficient coal-burning locomotive. He pointed out that, "under the stimulus of war, government-sponsored research has greatly added to the technology of our competitors, particularly the airplane, without any appreciable attention to the development of equipment for railroad use."

The twelve months ended last December 31 brought to the C. & O. new record volumes of traffic, both freight and passenger. Measured in dollars, the passenger business was eight times as large as in 1939, and represented an increase of 8.48 per cent over 1943. Passenger revenue for 1944 was $23,506,486 as compared with $21,669,413 in 1943.

Freight carried in 1944 totaled 102,470,851 tons, an increase of 995,474 tons over the year before. Bituminous coal constituted 77 per cent of the total freight tonnage and provided 64 per cent of freight revenues. Of the 78,316,370 tons of bituminous handled, 65,527,326 tons originated on the C. & O. lines.

Total operating revenues of the Chesapeake & Ohio attained a new high of $216,536,248, an increase of 3.85 per cent over 1943. However, net income after taxes of $27,340,995 was off 12.31 per cent from 1943. This drop in net was occasioned by an increase of $21,821,585 (18.97 per cent) in operating expenses over 1943, representing principally the added cost of handling the increased volume of traffic, higher costs of labor and materials, and increased amortization charges, without compensating increase in rates. Earnings per share were $3.57 in 1944 compared with $4.04 in 1943.

"Labor costs alone on the C. & O. last year were almost $10,000,000 more than in 1943," Mr. Newton said. "Retirements, depreciation and amortization charges on new equipment acquired and road improvements made to enable C. & O. to meet the war demands put upon it, and chargeable against income, increased $4,005,402 in 1944 over 1943, and will increase again in 1945. Yet, with all the factors which are increasing costs of railroad operation, there is no compensating rise in the price of the transportation which we sell. Taxes will take almost two-thirds of every dollar of net income earned before taxes in 1944. The excess profits tax will take 95 cents out of every net income dollar in excess profits tax brackets (subject to a 10 per cent post-war credit). The factors mentioned affect not only the Chesapeake & Ohio but most class I railroads of the country."

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Equipment Trust Certificates.*—This road has applied to the Interstate Commerce Commission for authority to assume liability for $2,100,000 of series Y equipment trust certificates in connection with the acquisition of 1,000 50-ton box cars to be built in company shops at a cost of about $2,800 each. Dividend rates on the certificates will be determined by competitive bidding.

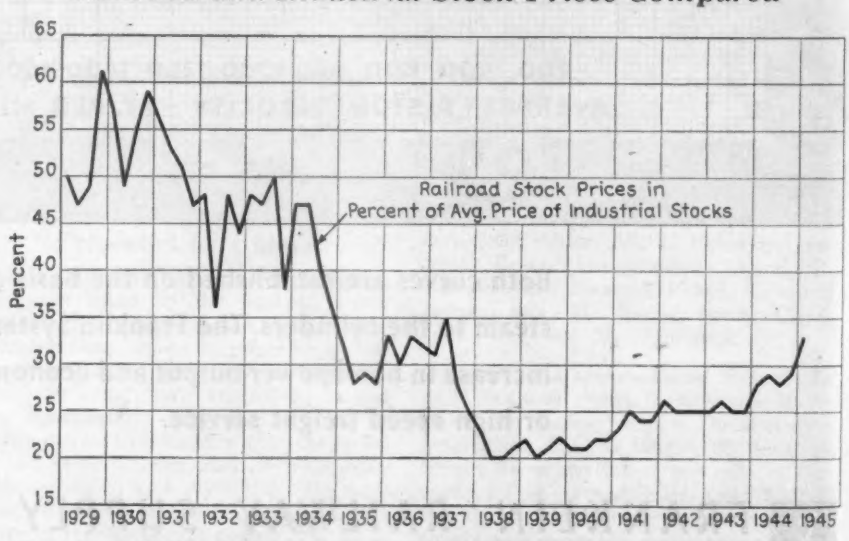
CHICAGO, ROCK ISLAND & PACIFIC-COLORADO & SOUTHERN.—*Lease of Burlington-Rock Island.*—Division 4 of the Interstate Commerce Commission has approved the terms and conditions of an agreement under which the Chicago, Rock Island & Gulf and the Fort Worth & Denver City (subsidiaries, respectively, of the Chicago, Rock Island & Pacific and the Colorado & Southern) will operate under lease the line of the Burlington-Rock Island from Teague, Tex., to Galveston. All securities of the B.-R.I. are held in equal portions by the C. & S. and the C. R.I. & G., and the C. & S. is controlled by the Chicago, Burlington & Quincy. The Burlington and Rock Island systems already operate the B.-R.I. line from Waxahachie, Tex., to Teague, 67 miles, under lease. The new agreement will eliminate the B.-R.I. as an operating company, with the proprietary lines taking over operation, as lessees of its owned line from Teague to Houston, 144 miles, and a branch from Teague to Mexia, 14 miles, and also its trackage rights over the Gulf, Colorado & Santa Fe from Houston to Galveston and over certain lines in Houston of the Houston Belt & Terminal, of which company the B.-R.I. owns one-fourth of the stock. The G. C. & S.F. likewise owns one-fourth of the terminal company's stock, as do each of two subsidiaries of the Missouri Pacific.

The agreement was approved by the division subject to prescribed conditions for the protection of employees who may be adversely affected. In general, these conditions followed the pattern of the Burlington case, 257 I.C.C. 700, affording in effect a 4-year guarantee of income equivalent to that earned in the road's employ.

As reported in *Railway Age* of January

* * * *

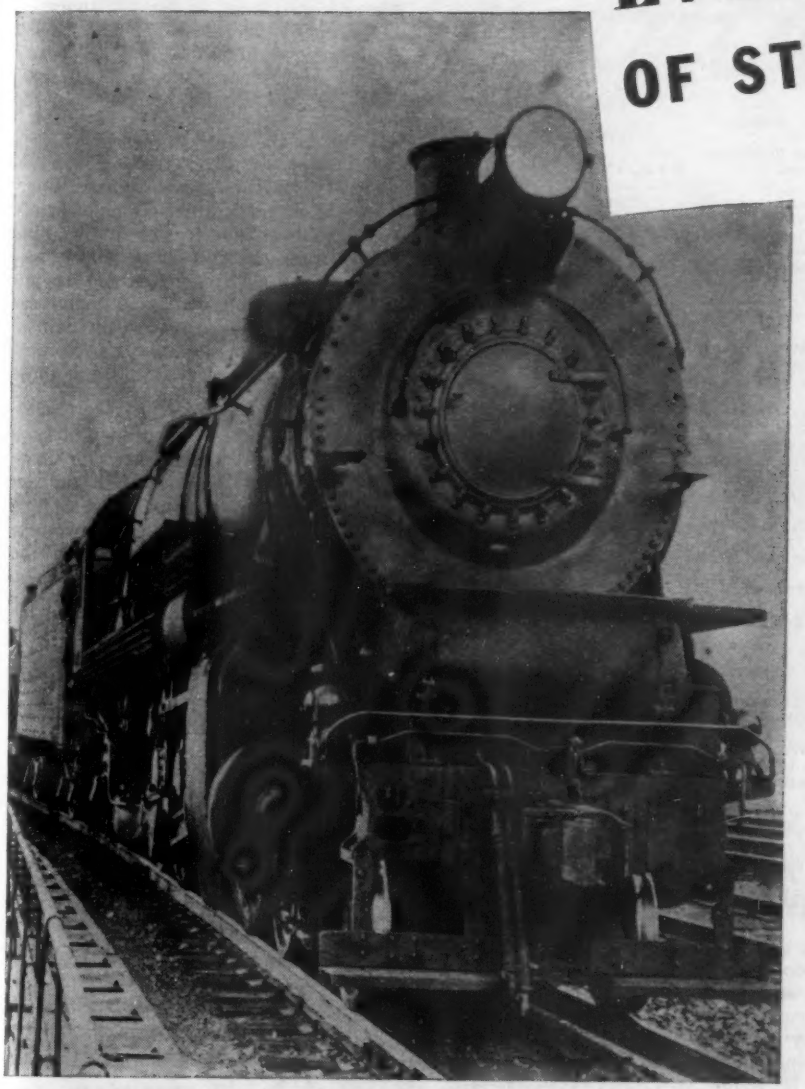
Railroad and Industrial Stock Prices Compared



Dow-Jones Railroad Average Monthly High Divided by Highs of Industrial Average for Mid-Quarter Months

News Department continued on next left-hand page

WHEN EVERY POUND OF STEAM COUNTS

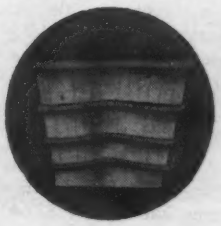


● When you are making every effort to secure maximum efficiency from your steam locomotives, remember the importance of maintaining a *complete* brick arch in the firebox.

For 35 years Security Sectional Arches have been saving fuel on all types of locomotives, and the harder a locomotive is worked the greater the proportionate fuel saving.

The cost of maintaining a complete arch is but a fraction of that of the coal conserved.

HARBISON-WALKER REFRACTORIES CO.
Refractories Specialists



AMERICAN ARCH CO. INC.
60 East 42nd Street, New York 17, N. Y.
Locomotive Combustion Specialists

6, page 134, Examiner R. R. Molster, in a proposed report, had recommended that the commission approve the lease arrangement "in principle," deferring entry of an order making the approval effective, however, until consummation of an arrangement covering the relationship between the lessees and the terminal company that would be acceptable to the parties concerned. This relationship became involved in the proceeding when the Missouri Pacific objected to approval of the lease agreement so far as the lessor's rights with respect to use of the terminal company's property would be transferred to the lessees. It was indicated that a judicial determination of this question might be required.

On this question the division held that "the terms and conditions upon which the lessor uses the terminal company's facilities are certain; but it is uncertain whether the lessees will be able to use these facilities upon that basis. It is also uncertain whether that basis will be disturbed. Under the circumstances we feel compelled to treat the application as a proposal to lease the lessor's rights in the use of the terminal company's properties upon the same basis as such rights are now being exercised and enjoyed by the lessor. . . . This determination is not to be construed as an expression of opinion with respect to the questions of contract construction raised by the Missouri Pacific trustee. If, by reason of agreement of the interested parties, or by judicial determination, terms and conditions for use of the terminal company's property by the lessees should be settled "upon a different basis, further consideration by the commission will be required before approval of those terms is given. Meanwhile, however, an order was issued approving the agreement, subject to the conditions noted.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to assume liability for $1,570,000 of equipment trust certificates in connection with its purchase of two 1,000-hp. and three 660-hp. Diesel-electric switching locomotives, 400 50-ton box cars, and 100 50-ton hopper cars.

DETROIT & MACKINAC.—*Annual Report.*—The 1944 annual statement of this company shows a net deficit, after interest and other charges, of $19,439, as compared with a net deficit of $147,708 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
RAILWAY OPERATING REVENUES	$1,016,205	+$40,493
Maintenance of way and structures	218,350	−107,688
Maintenance of equipment	210,797	+11,733
Transportation—rail line	383,181	+31,138
TOTAL OPERATING EXPENSES	869,294	−63,356
Operating ratio	85.5	−10.1
NET REVENUE FROM OPERATIONS	146,911	+103,849
Railway tax accruals	51,866	−28,937
RAILWAY OPERATING INCOME	95,045	+132,786
Equipment rents—Net Dr.	30,459	+10,389
Joint facility rents	680	−390
TOTAL INCOME	70,380	+122,363
Interest on funded debt	87,240	−5,600
INCOME BALANCE TRANSFERRED TO PROFIT AND LOSS—Dr.	19,439	−128,269

LONG ISLAND.—*Annual Report.*—The 1944 annual statement of this road shows a net income, after interest and other charges, of $983,280, as compared with a net income of $2,593,419 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	376.43	.....
RAILWAY OPERATING REVENUES	$44,947,735	+$1,970,007
Maintenance of way and structures	6,728,707	+286,161
Maintenance of equipment	6,491,145	+681,079
Transportation	19,592,154	+1,924,300
TOTAL OPERATING EXPENSES	33,792,628	+2,886,542
NET REVENUE FROM OPERATIONS	11,155,107	−916,535
Railway tax accruals	5,366,690	−381,180
RAILWAY OPERATING INCOME	5,788,418	−535,355
Hire of equipment—Net Dr.	1,830,879	+336,036
Joint facility rents—Net Dr.	1,143,889	+51,052
NET RAILWAY OPERATING INCOME	2,813,649	−922,443
Non-operating income	492,885	−745,699
GROSS INCOME	3,306,535	−1,668,141
Rent for leased roads	195,000	.....
Interest on funded debt	1,859,389	−43,861
TOTAL DEDUCTIONS FROM GROSS INCOME	2,323,254	−58,003
NET INCOME TRANSFERRED TO PROFIT AND LOSS	983,280	−1,610,139

MISSOURI PACIFIC. — *Seeks to Pay R. F. C. Debt.*—Four directors of the Missouri Pacific have asked permission of the Federal court to make immediate payment of $32,096,430 to the Reconstruction Finance Corporation for a 1932 loan. In their petition the directors asserted that the railroad, which is in process of reorganization, has enough cash or its equivalent on hand to pay the R. F. C. the $23,134,800 principal plus interest. The petitioners are William H. Biggs, St. Louis, Mo.; Donald D. Wilson, Chicago; and Seymour Smith and John J. Rolph, of New York.

NEW YORK, CHICAGO & ST. LOUIS.—*New Director.*—Richard A. Nelson, of New York, has been elected a director of the Nickel Plate. Mr. Nelson is vice-president, secretary and a director of the American Equitable Assurance Co., the Globe & Republic Insurance Co. of America, the Knickerbocker Insurance Co., and the Merchants & Manufacturers Insurance Co.

SEABOARD AIR LINE.—*Equipment Trust Certificates.*—This road has applied to the Interstate Commerce Commission for authority to assume liability for $2,640,000 of series NN equipment trust certificates in connection with the acquisition of the following equipment, on which a cash payment of 25 per cent of total cost is being made: From the Electro-Motive Division of General Motors Corporation, 4 2,000-hp. Diesel-electric passenger locomotives at $174,480 each; from the Baldwin Locomotive Works, 4 1,000-hp. Diesel-electric switching locomotives at $78,905 each; from the Pullman-Standard Car Manufacturing Company, 500 50-ton box cars, 250 single-door type at $3,215 each and 250 double-door type at $3,372 each; and from the Bethlehem Steel Company, 300 50-ton flat cars at $2,962 each.

The Reconstruction Finance Corporation has announced the sale to Halsey, Stuart & Company of $1,397,000 of this road's series JJ 3 per cent equipment trust certificates at 105.45, the premium to the R. F. C. amounting to $76,136.

ST. LOUIS-SAN FRANCISCO.—*Trustee.*—Division 4 of the Interstate Commerce Commission has considered the petition of Frank A. Thompson as sole trustee of this road in reorganization proceedings under section 77 of the Bankruptcy Act, and has approved as reasonable maximum compensation of $30,000 a year, in view of his now performing the duties ordinarily performed by a chief executive officer as well as those of sole trustee.

ST. LOUIS SOUTHWESTERN. — *Trackage Rights.*—Division 4 of the Interstate Commerce Commission has approved an extension of the agreement under which this road's affiliate, the St. Louis Southwestern of Texas, operates on the tracks of the Dallas Terminal Railway & Union Depot.

TORONTO, HAMILTON & BUFFALO.—*Annual Report.*—The 1944 annual report of this road shows a net income, after interest and other charges, of $749,510 as compared with $685,408 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	111.03	.....
RAILWAY OPERATING REVENUES	$3,897,589	−$178,637
TOTAL OPERATING EXPENSES	2,430,893	+317,036
Operating ratio	62.37	+10.51
NET REVENUE FROM OPERATIONS	1,466,696	−495,673
Railway tax accruals	622,549	−547,039
RAILWAY OPERATING INCOME	844,147	+51,365
Equipment rents, Net Cr.	2,450	+7,492
Joint facility rents, Net Cr.	73,360	−206
NET RAILWAY OPERATING INCOME	919,957	+58,651
Non-operating income	53,078	+396
GROSS INCOME	973,035	+59,048
Interest on funded debt	204,240	.....
TOTAL DEDUCTIONS FROM GROSS INCOME	223,525	−5,054
NET INCOME TRANSFERRED TO EARNED SURPLUS	749,510	+64,102

UNION PACIFIC.—*Ashby Becomes Director.*—G. F. Ashby, executive vice-president

News Department continued on next left-hand page

Superheaters are designed to efficiently handle the maximum steam consumption of each type of locomotive. This means a fixed amount of superheating surface, steam area through the superheater, gas area — all related to boiler evaporation, grate area and other factors. In short the boiler is balanced.

Any cutting off of units and patching of pipes, etc., resulting in a reduction in steam area or to the flow of gases . . . produces an unbalanced condition.

Maintain this essential balance by having old superheater units remanufactured at our plant, where the balance line will be maintained.

ELESCO

A-1708

SUPERHEATERS • FEEDWATER HEATERS
AMERICAN THROTTLES • STEAM DRYERS
EXHAUST STEAM INJECTORS • PYROMETERS

THE SUPERHEATER COMPANY

Representative of
AMERICAN THROTTLE COMPANY, INC.
60 East 42nd Street, NEW YORK
122 S. Michigan Blvd., CHICAGO
• • •
Montreal, Canada
THE SUPERHEATER COMPANY, LTD.

of the Union Pacific, at Omaha, Neb., has been elected a director of that road.

Average Prices Stocks and Bonds

	March 27	Last week	Last year
Average price of 20 representative railway stocks..	48.70	50.51	39.78
Average price of 20 representative railway bonds..	95.56	96.17	87.19

Dividends Declared

Kansas City Southern.—4% preferred, 50¢, irregular, payable April 16 to holders of record March 31.

Norfolk & Western.—adj. preferred, $1.00, quarterly, payable May 10 to holders of record April 18.

Reading.—25¢, quarterly, payable May 10 to holders of record April 12.

Spokane International.—(escrow receipts) $2.50, payable April 1 to holders of record March 22.

Western Pacific—Common, 75¢, preferred, $1.25, both quarterly, both payable May 15, August 15, November 15, and February 15 to holders of record May 1, August 1, November 1, and February 1 respectively.

Railway Officers

EXECUTIVE

Wayne A. Johnston, president of the Illinois Central, at Chicago, has been elected chairman of the board of the Peoria & Pekin Union, with the same headquarters.

Hugh Shoobridge, chief statistician in the office of the vice-president of the Canadian Pacific at Montreal, Que., has been promoted to assistant to vice-president, special duties.

James Spicer Murray, vice-president of the Baltimore & Ohio at Baltimore, Md., has retired after 58 years of service. Mr. Murray, who was born at Baltimore on February 3, 1872, and received his LL.B. from the University of Maryland in 1894, entered the service of the Baltimore & Ohio on April 16, 1886, as a clerk in the mechanical department at Baltimore. In April,

James S. Murray

1892, he was appointed secretary to the comptroller, and three years later he was promoted to chief clerk to the comptroller. In 1904 he was named chief of the voucher bureau, remaining in that post until 1910, when he was elevated to assistant to the president. Mr. Murray served as vice-president of the Baltimore & Ohio and as a director of all its subsidiaries from 1936 until his retirement.

James T. O'Dea, general manager of the Peoria & Pekin Union at Peoria, Ill., has been elected president, with the same headquarters, succeeding **E. I. Rogers,** who has retired at his own request.

FINANCIAL, LEGAL AND ACCOUNTING

R. W. Krumrine, special claim agent of the Pennsylvania at Philadelphia, Pa., has been appointed chief claim agent of the eastern region, succeeding **R. E. Harrington,** retired.

David I. Mackie has been appointed general solicitor of the Delaware, Lackawanna & Western with headquarters at New York. Mr. Mackie was graduated from Williams College in 1926 and received his bachelor of laws degree from Harvard Law School in 1929, the same year in which he became a member of the bar of the State of New York. After engaging in the practice of corporation, real estate, and tax law, he became associated with the firm of Hardy, Stancliffe & Hardy at New York in June, 1944, and subsequently handled proceedings incident to the merger of the American Car & Foundry Motors Co. with the Brill Corporation, which resulted in the ACF-Brill Motors Company.

David I. Mackie

A. R. Hardwick, general accountant of the Atlantic Coast Line, has been appointed auditor of disbursements at Wilmington, N. C., succeeding **J. E. Shannon,** whose death is reported elsewhere in these columns.

Joseph A. McClain, Jr., vice-president and general counsel of the Terminal Railroad Association of St. Louis, at St. Louis, Mo., has been appointed general counsel of the Wabash, with the same headquarters, succeeding **Carleton S. Hadley,** whose death on February 16 was reported in the *Railway Age* of March 3.

Carlisle Needham, assistant manager of the insurance department of the Southern at Washington, D. C., has been promoted to manager of that department, succeeding **W. A. Fravel,** who will retire on April 1 after 47 years of service. Mr. Needham who was born on January 22, 1890, at Baltimore, Md., and attended Baltimore Polytechnic Institute, entered the service of the Southern as a clerk in the freight traffic department at Baltimore in January, 1909. After becoming ticket agent in September, 1910, he joined the Norfolk & Western as city ticket agent at Washington in March, 1912, and later served as passenger agent. He returned to the Southern in August, 1918, as an inspector in the insurance department, and in December, 1941, he was promoted to assistant manager, the position he held at the time of his recent appointment as manager.

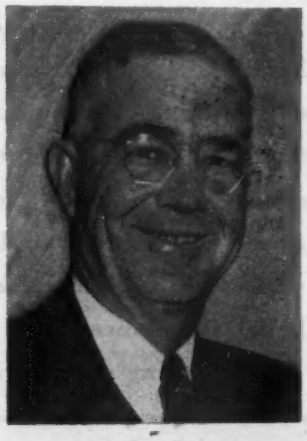
Mr. Fravel was born at Luray, Va., on March 9, 1875, and joined the Southern as a stenographer in the office of the general agent at Norfolk, Va., on March 23, 1898. Three years later he transferred to Washington as insurance clerk in the office of the assistant general manager, subsequently serving as stenographer and clerk in the insurance department until January, 1907, when he was promoted to chief clerk to the superintendent of insurance. Mr. Fravel was assistant manager of insurance from December, 1941, to October, 1942, when he was advanced to manager of insurance, the position from which he now retires.

OPERATING

E. H. Cook has been appointed trainmaster, Acala district, of the Atlantic Coast Line with headquarters at Dunnellon, Fla.

J. M. Collins, assistant superintendent of dining cars of the Erie at Jersey City, N. J., has been appointed acting superintendent of dining cars succeeding **I. A. Canning,** who has been granted an indefinite leave of absence.

William H. Jones, whose promotion to division superintendent of the Atchison, Topeka & Santa Fe, with headquarters at Chanute, Kan., was reported in the *Railway Age* of March 10, was born at Niota, Ill., on December 30, 1891. He entered railway service with the Santa Fe in 1905 as a track laborer of the Illinois division. He subsequently served as timekeeper, assistant foreman, assistant extra gang foreman and section foreman until 1924 when he was



William H. Jones

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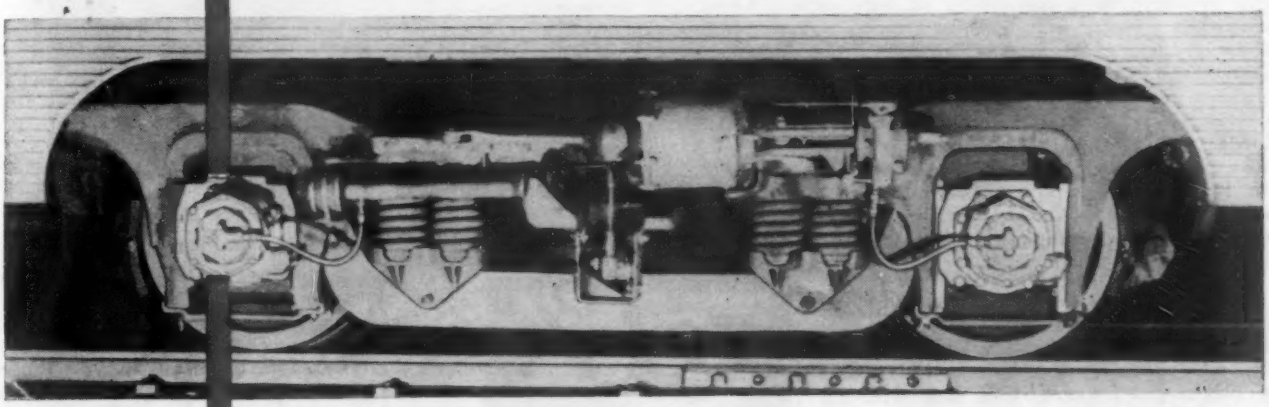
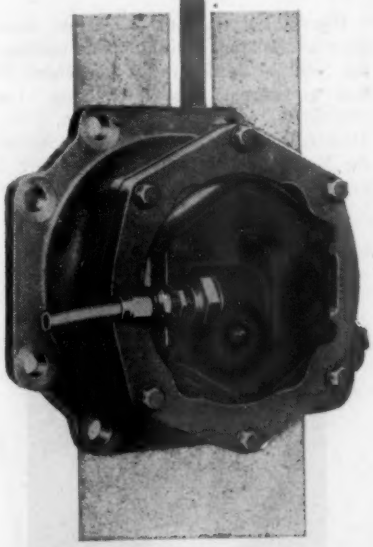
The "AP" Decelostat Equipment

A Mechanical–Pneumatic Means of Averting Wheel Sliding





SOFTENS THE BRAKE WHEN WHEEL SLIP IMPENDS.

"AP" Decelostat Equipment—Mechanical-Pneumatic Wheel Slip Control is now available for passenger cars.

Installation is confined wholly to the truck—no connections to the car body are required.

Driven from the end of the axle, the "AP" Decelostat continuously checks wheel performance at the scene of action and detects the slightest wheel slip when brakes are applied. Wheel slip is detected and arrested within a second by reduction in braking pressure, followed immediately by pressure restoration.

★

The Decelostat softens the braking force momentarily, permitting the affected wheel to regain train speed.

Westinghouse Air Brake Company

Wilmerding, Pa.

promoted to roadmaster. In March, 1942, Mr. Jones was appointed trainmaster at LaJunta, Colo., and on January 5, 1945, he was advanced to acting superintendent with headquarters at Slaton, Tex., the position he held at the time of his new appointment.

Fred Larsen, terminal trainmaster of the Union Pacific at Council Bluffs, Iowa, has been promoted to terminal superintendent, with the same headquarters. **A. A. Haussener,** assistant terminal trainmaster, has been advanced to terminal trainmaster, with headquarters as before at Council Bluffs, succeeding Mr. Larsen.

R. H. Carter, assistant terminal manager of the Illinois Central at Chicago, has been promoted to superintendent of the Mississippi division, with headquarters at Water Valley, Miss., succeeding **T. J. Casey,** who has been transferred to the Louisiana division, with headquarters at McComb, Miss. Mr. Casey replaces **W. E. Davis,** who has been transferred to the Iowa division, with headquarters at Waterloo, Iowa, where he succeeds **C. J. Fitzpatrick,** whose promotion to general superintendent of transportation was reported in the *Railway Age* of March 24.

Severn Teackle Wallis Green, whose appointment as general superintendent of the Lehigh & New England at Bethlehem, Pa., was announced in the *Railway Age* of February 17, was born at Baltimore, Md., on January 6, 1894, and after attending Baltimore Polytechnic Institute he entered railroading in the engineering department of the Baltimore & Ohio in 1911. In 1912 Mr. Green joined the engineering organization of the Baltimore Sewerage Commission, resigning in 1914 to attend Cornell University, from which he received his degree in civil engineering in 1916. After being employed by the division of valuation of the Interstate Commerce Commission from 1916 to 1917, he returned to the valuation department of the Baltimore & Ohio, where he remained until 1931, except for a period during the first world war when he served overseas as a lieutenant in the engineer reserve. In January, 1931, Mr. Green was appointed valuation engineer and real estate agent of the Lehigh & New England, and in May, 1936, became assistant to the general superintendent. Promoted to superintendent at Bethlehem on January 1, 1939, he remained in that post until his recent advancement to general superintendent there.

TRAFFIC

Andrew L. Bay has been appointed assistant general freight agent of the Southern at Atlanta, Ga., effective April 1.

Roland Turner, general forestry agent of the Southern at Dorchester, S. C., will retire on June 1 after more than 33 years of service.

Howard W. Talmadge has been appointed assistant general freight agent of the Southern, with headquarters at New Orleans, La.

W. M. Wharton, assistant general passenger agent of the Atlantic Coast Line at Jacksonville, Fla., has been promoted to assistant passenger traffic manager there. **Ray Paschall** and **H. E. Wright** have been named assistant general passenger agents at Orlando, Fla., and Miami, respectively. **S. B. Lewis** and **Ned R. Mitchell** have been appointed division passenger agents at Charleston, S. C., and St. Petersburg, Fla., respectively.

W. A. Cheney has been appointed general agent of the Union Pacific, with headquarters at Santa Monica, Cal., succeeding **S. C. Frost,** who has retired after 33 years of service.

H. A. Whitney, assistant general agent of the Delaware, Lackawanna & Western at Philadelphia, Pa., has been promoted to general agent, with headquarters at Milwaukee, Wis., succeeding **J. R. McDowell,** who has retired after 40 years of service.

Rudolph S. Voigt, general eastern passenger agent of the Atlantic Coast Line at New York, has been appointed assistant passenger traffic manager with the same headquarters. Mr. Voigt was born at Chicago on November 26, 1894, and entered railroading in 1912 with the New York

Rudolph S. Voigt

Central. In February, 1924, he joined the Atlantic Coast Line as northwestern passenger agent at Chicago, where he remained until August, 1932, when he became eastern passenger agent of the A. C. L. at New York. He was promoted to general eastern passenger agent there on January 1, 1934, and was transferred to Wilmington, N. C., as general passenger agent in October, 1943. Mr. Voigt returned to New York in October, 1944, as general eastern passenger agent, the position he held at the time of his recent appointment as assistant passenger traffic manager there.

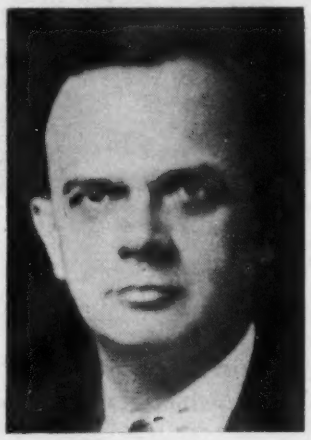
Charles E. Potts, assistant to the general manager, express department, of the Canadian National at Montreal, Que., has been promoted to assistant general manager, and his former position has been abolished. **Thomas Hilliard Martin,** traffic manager, express department at Montreal, has been named general superintendent of traffic and transportation. The position of traffic manager has been eliminated. **Clifford W. Smith,** superintendent of transportation, has been appointed superintendent of traffic, and **Robert Aitken,** special representative in the office of the general manager, has been named superintendent of transportation succeeding Mr. Smith.

Mr. Martin, who was born at Hamilton, Ont., on March 27, 1900, entered railroading as a clerk with the Canadian Northern

Thomas H. Martin

Express (now Canadian National Express) at Toronto, Ont., in 1917, and was appointed accountant there in 1920, becoming chief clerk the following year. In 1922 he was named traffic clerk in the office of the general manager at Montreal, and he remained in that post until 1929 when he became assistant chief clerk there. In April, 1938, Mr. Martin was promoted to superintendent of traffic and transportation, and in 1942 he was named traffic manager, the position he held at the time of his recent elevation to general superintendent of traffic and transportation.

Floyd Edgar Lewis, whose appointment as assistant freight traffic manager of the New York Central at Cleveland, Ohio, was announced in the *Railway Age* of March 10, was born at Fayette, Ohio, on March 5, 1884, and entered the service of the New York Central in September, 1899, as a student operator at Deerfield, Mich.



Floyd E. Lewis

After serving as agent and operator, he became soliciting freight agent at Toledo, Ohio, in 1910, and subsequently served as commercial agent at Detroit, Mich., and division freight agent at Detroit and at Hillsdale, Mich., until 1921, when he was named assistant general freight agent at

News Department continued on next left-hand page

THE HERITAGE OF OLD 999

WHEN old 999 astounded the Gay but Leisurely Nineties with its incredible speed, it relied upon driving wheels and other important parts made from HUNT-SPILLER *Air Furnace* GUN IRON. For even then, the use of HSGI was a long-established practice in locomotive building and maintenance.

Time has wrought vast changes in railroading since those days, but HUNT-SPILLER *Air Furnace* GUN IRON remains a dependable constant for valves, cylinders, and other vital locomotive components. Stubborn resister of heat and wear, this dense uniform material with its unique physical characteristics may be relied upon to conserve fuel and maintain efficiency for longer periods.

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HUNT-SPILLER GUN IRON
Air Furnace

Detroit, transferring to Cleveland in 1928. Mr. Lewis was appointed industrial agent there in 1939, and was promoted to assistant to freight traffic manager with the same headquarters in 1944, remaining in the latter post until his recent elevation to assistant freight traffic manager.

George J. Garmon, general agent of the Union Pacific, with headquarters at New Orleans, La., has retired after 40 years of service.

George A. Hager and **F. William Peach** have been appointed general freight agent and general agent respectively of the Duluth, South Shore & Atlantic, both with headquarters at Detroit, Mich.

Robert E. King, assistant to the general passenger agent of the Chicago, Rock Island & Pacific at Chicago, has been promoted to assistant general passenger agent, with the same headquarters.

Thomas J. Murphy, traveling freight agent of the Chicago, Rock Island & Pacific at Colorado Springs, Colo., has been promoted to general agent, with headquarters at Salt Lake City, Utah, succeeding **Andrew Jensen,** who has retired after 36 years of service.

Louis F. Heineck, general agent, passenger department, of the Delaware, Lackawanna & Western at Buffalo, N. Y., has been transferred to Philadelphia, Pa., succeeding **J. C. Dawson,** who has relinquished his position because of ill health. Mr. Dawson will continue in the company's service as special representative.

George A. Hager, whose promotion to general freight agent of the Duluth, South Shore & Atlantic, with headquarters at Detroit, Mich., was reported in the *Railway Age* of March 24, was born at Marquette, Mich., on June 20, 1897, and is a graduate of the Staunton Military Academy, Staunton, Va. He entered railway service on October 24, 1919, as a trainman of the D. S. S. & A., later serving as passenger and freight brakeman and joint baggage and express messenger, and assistant special agent. On February 15, 1940, Mr. Hager was promoted to general agent, with headquarters at Bay City, Mich., and on June 15, 1942, he was transferred to Grand Rapids, Mich., remaining in that location until his new appointment, effective March 15.

James E. Carter, whose promotion to general freight agent of the Texas & New Orleans (part of the Southern Pacific System), with headquarters at New Orleans, La., was reported in the *Railway Age* of March 24, was born at New Iberia, La., on August 17, 1889. He entered railway service on November 4, 1904, as a car checker of the T. & N. O., at Patterson, La., subsequently serving as traveling freight and passenger agent at New Iberia; agent at Lake Charles, La.; dispatcher at Lafayette, La., and assistant general freight and passenger agent at Lake Charles. In July, 1928, Mr. Carter was promoted to assistant general freight agent, with headquarters at Houston, Tex., and two years later he was advanced to assistant freight traffic manager, with the same headquarters, the position he held at the time of his new appointment.

ENGINEERING & SIGNALING

Robley H. Morrison, Jr., whose promotion to principal assistant engineer of the Bangor & Aroostook at Houlton, Me., was announced in the *Railway Age* of February 10, was born at Rumford, Me.,

Robley H. Morrison, Jr.

on February 15, 1912, and was graduated from the University of Maine in 1936. He worked as an engineer and inspector for the bridge division of the Maine State Highway Commission from 1936 to 1938, and was later engaged in construction work at Waterville, Me., until 1940. On February 1, 1940, Mr. Morrison joined the Bangor & Aroostook as superintendent of bridges and buildings at Houlton, the position he held at the time of his recent advancement to principal assistant engineer.

SPECIAL

Floyd F. Ridley, district traffic manager of the Kansas City Southern at Kansas City, Mo., has been promoted to director of development, with the same headquarters. Mr. Ridley was born at Dalton, Ga., on November 7, 1900, and entered railroad service on March 1, 1916, in the Dalton freight office of the Southern, holding

Floyd F. Ridley

various clerical positions with that road and with the Nashville, Chattanooga & St. Louis until February 1, 1924, when he became chief clerk in the division freight office of the Southern at Lynchburg, Va. On October 1, 1926, Mr. Ridley joined E. I. du Pont de Nemours & Co., at Wilmington, Del., as traffic manager, resigning in 1943 to accept the position he held at the time of his new appointment.

MECHANICAL

L. M. Cornell, general foreman of the Atlantic Coast Line at High Springs, Fla., has been appointed acting master mechanic at Waycross, Ga., replacing **T. B. Dobbins,** who has been granted a leave of absence on account of illness.

OBITUARY

James B. Coffey, chairman of the standing rate committee of the Western Trunk Line Committee, with headquarters at Chicago, died suddenly at a hospital in that city on March 26.

John Dickie, treasurer of the Chicago, Milwaukee, St. Paul & Pacific, whose death on February 24 was reported in the *Railway Age* of March 3, was born at Dundas, Ont., on August 22, 1877, and entered railway service at the age of 13 as an office boy of the Milwaukee's general agent at Chicago. Three years later he was transferred to the office of the treasurer, and in 1915 he was promoted to chief clerk. In 1917 Mr. Dickie was advanced to assistant treasurer, with the same headquarters, and in December, 1926, he was promoted to the position he held at the time of his passing.

Frank Wright Noxon, who retired in 1932 as secretary of the Railway Business Association with headquarters at Washington, D. C., died at Alexandria, Va., on March 20. Mr. Noxon, who was born at Syracuse, N. Y., on March 25, 1873, attended Syracuse University from 1890 to 1892, and Harvard University, College of Journalism, from 1892 to 1894; and he received his Ph.B. from Syracuse University in 1911. After serving as reporter and editor of various New England newspapers and as course lecturer in vocational guidance at the Boston (Mass.) Public High School of Commerce, Mr. Noxon was appointed secretary of the Railway Business Association in 1908, and served in that capacity until his retirement in 1932.

John E. Shannon, auditor of disbursements of the Atlantic Coast Line at Wilmington, N. C., died there on February 13. Mr. Shannon, who was born at Savannah, Ga., on January 12, 1895, entered railroading with the A. C. L. on July 5, 1911, as a clerk in the office of the auditor of freight receipts, and subsequently became clerk in the purchasing department and stenographer in the office of the comptroller. Following his return to the company in 1919 after serving overseas with the United States armed forces, during the first world war, he was appointed bookkeeper in the comptroller's office, and later held positions as traveling auditor, chief clerk to the auditor, station accounts; chief clerk to the comptroller; assistant auditor of disbursements, and general accountant successively. On July 26, 1943, Mr. Shannon was appointed auditor of disbursements, the position he held at the time of his death.

Report N
March 31, 1945

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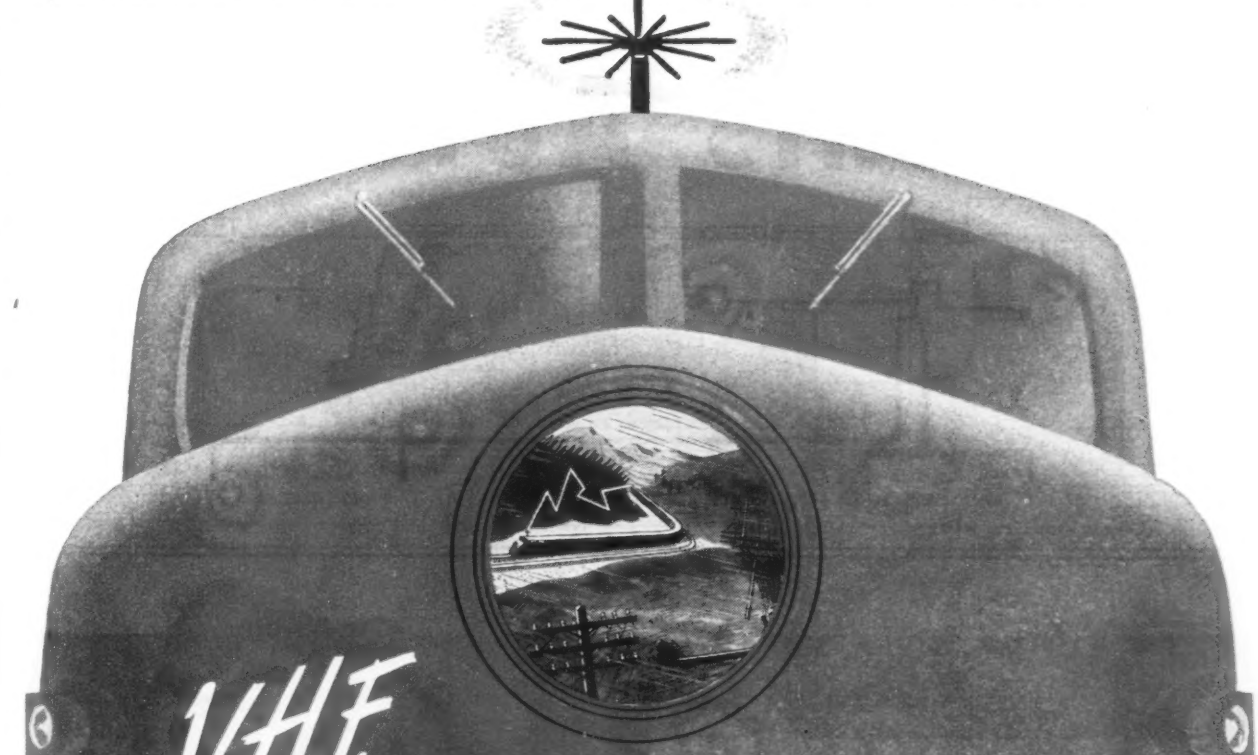
Report **No. 9** on the latest advance in railroad communications



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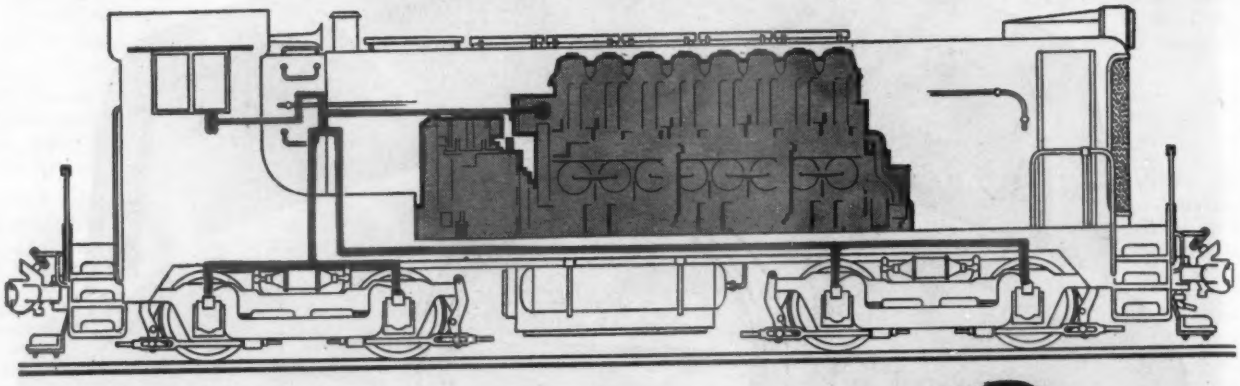

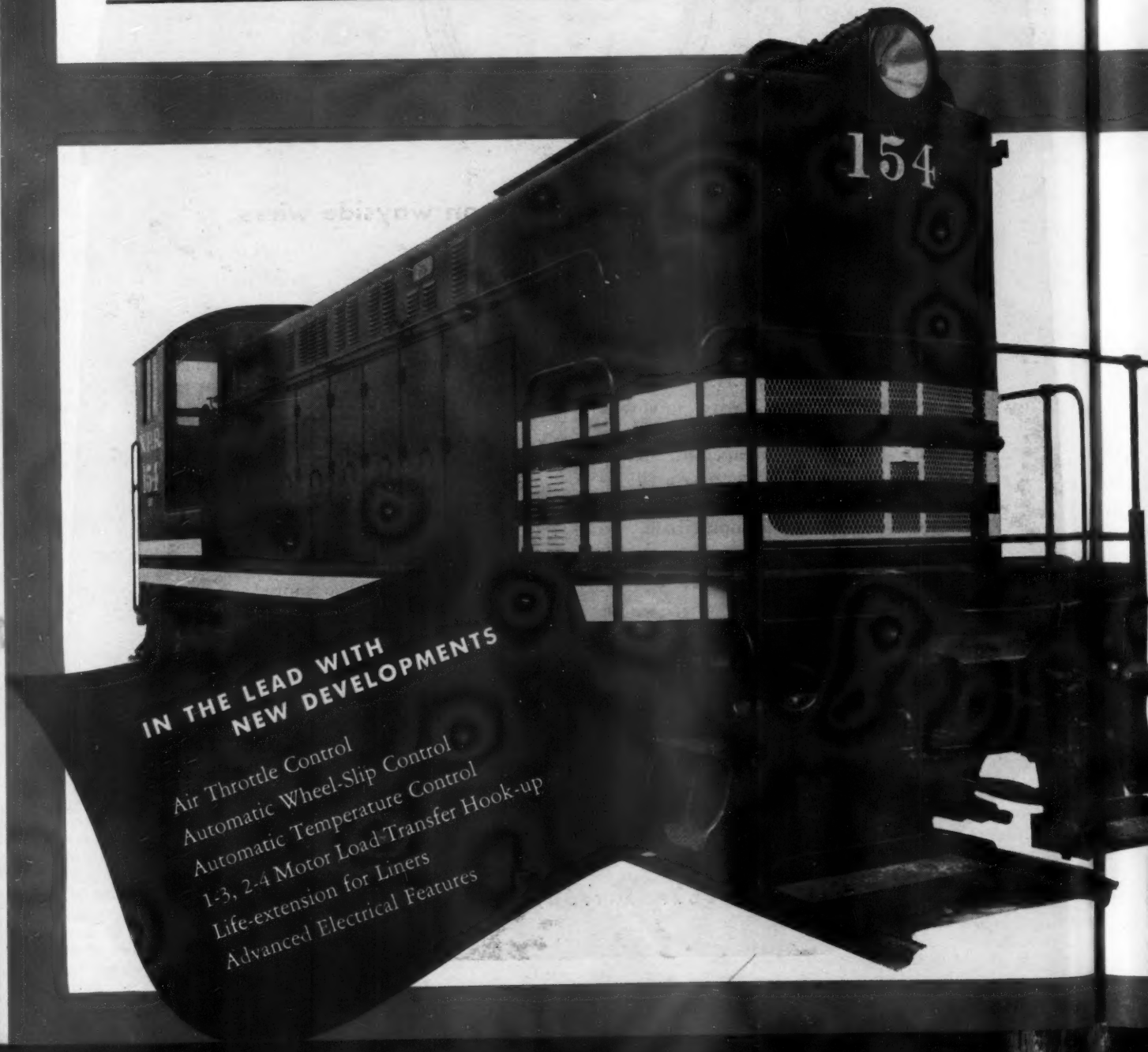

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feature saves wear and shocks on

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Wheels don't continue to slip and spin on the modern Baldwin-Westinghouse Diesel-Electric Locomotive when a start is made with a heavy load or a bad rail condition. The moment traction is lost the diesel engine speed is immediately and automatically throttled down by a simple, positive slip-control device. When slippage ceases engine speed smoothly increases to the point determined by position of throttle handle. Excessive wheel and rail wear is halted . . . destructive shocks are avoided . . . and premature failures from these common causes are eliminated.

Wheel-slip prevention is only one of a number of important features—many of them exclusive on Baldwin-Westinghouse units.

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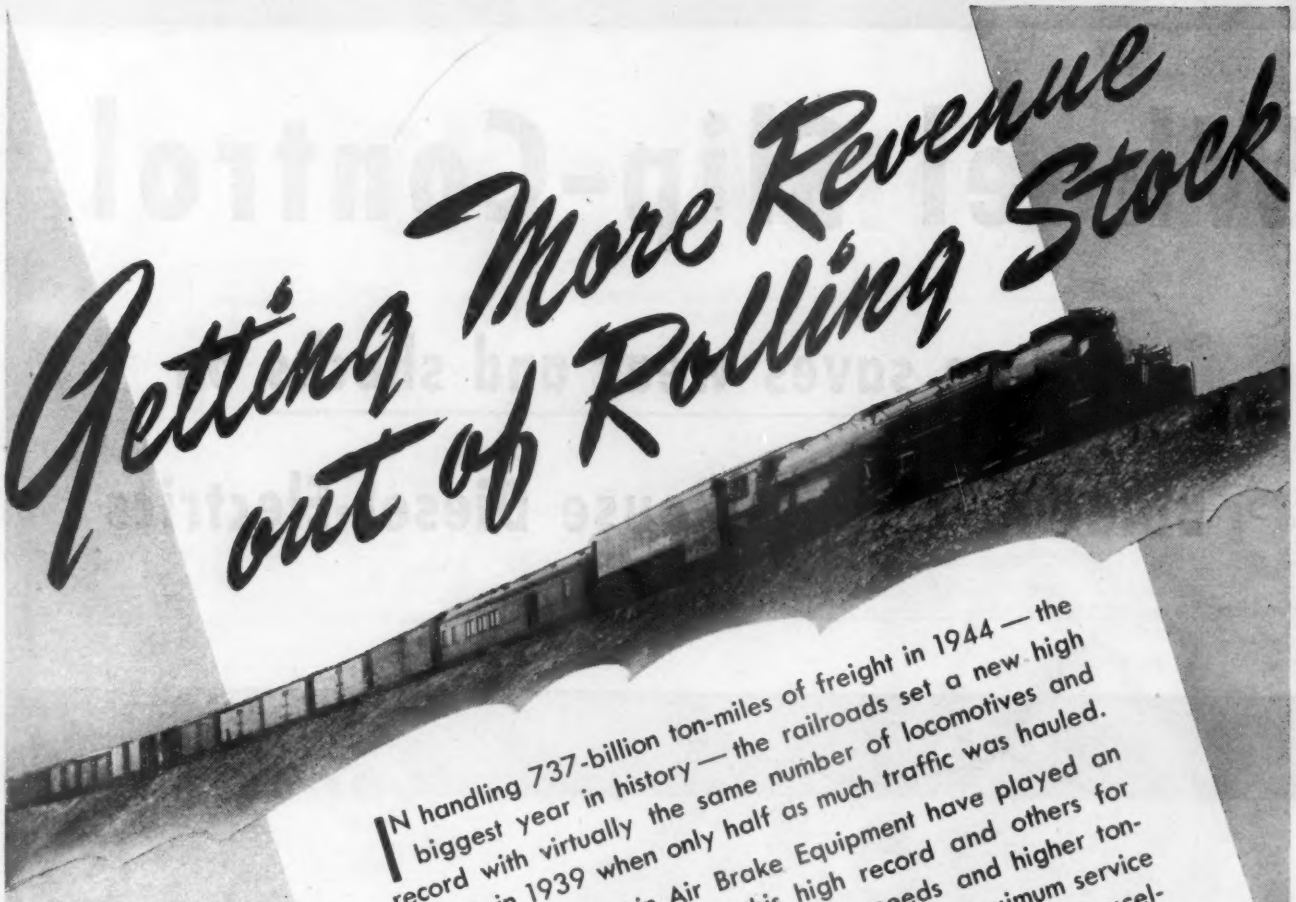
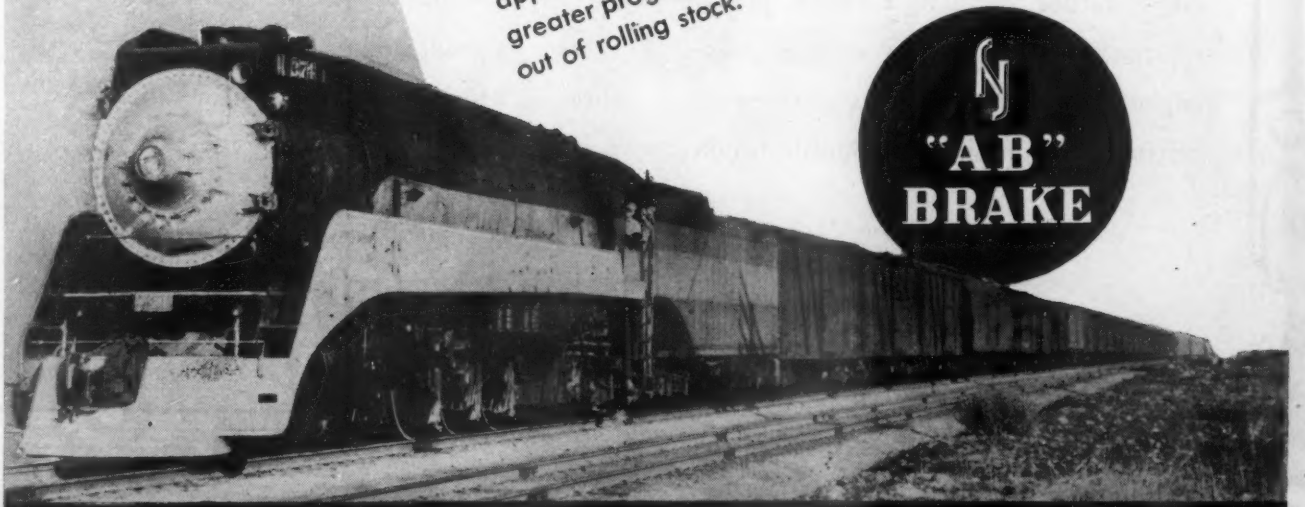
Getting More Revenue out of Rolling Stock



IN handling 737-billion ton-miles of freight in 1944 — the biggest year in history — the railroads set a new high record with virtually the same number of locomotives and cars as in 1939 when only half as much traffic was hauled. The improvements in Air Brake Equipment have played an important part in setting this high record and others for greater train tonnage, faster train speeds and higher ton-miles per car and per locomotive. Getting maximum service and revenue out of rolling stock is smart business, and excellent results have been achieved by the installation of the "AB" Brake. Plans for the future should include general application of "AB" Brakes on all freight cars to insure greater progress in freight train operation and more revenue out of rolling stock.



"AB" BRAKE

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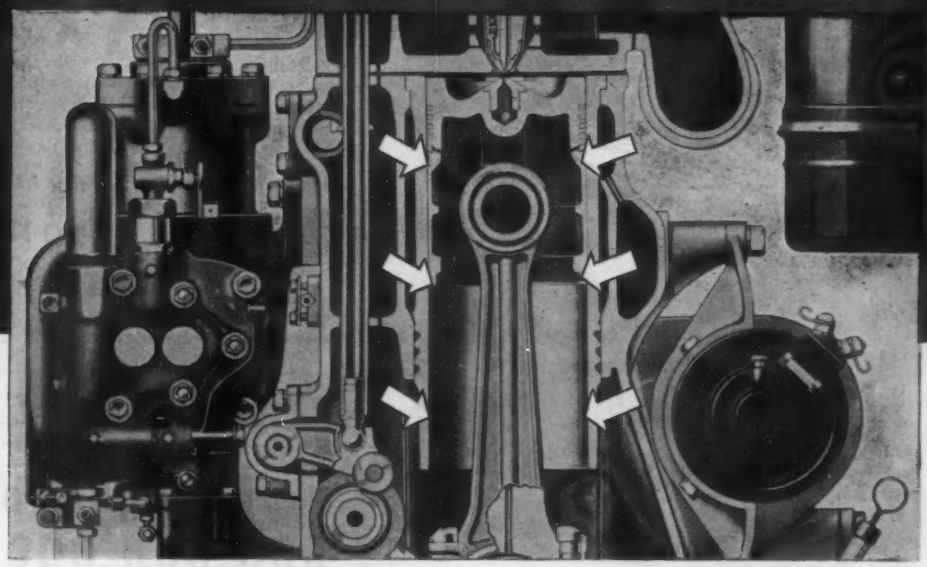
protects the wear-zone



The greatest wear in Diesel and gasoline engines is on the cylinder walls in the zone traveled by the piston and rings. Corrosion from the products of combustion, and heat, and abrasion, and the difficulty of adequate lubrication all contribute to the rapid wearing of the cylinder wall.

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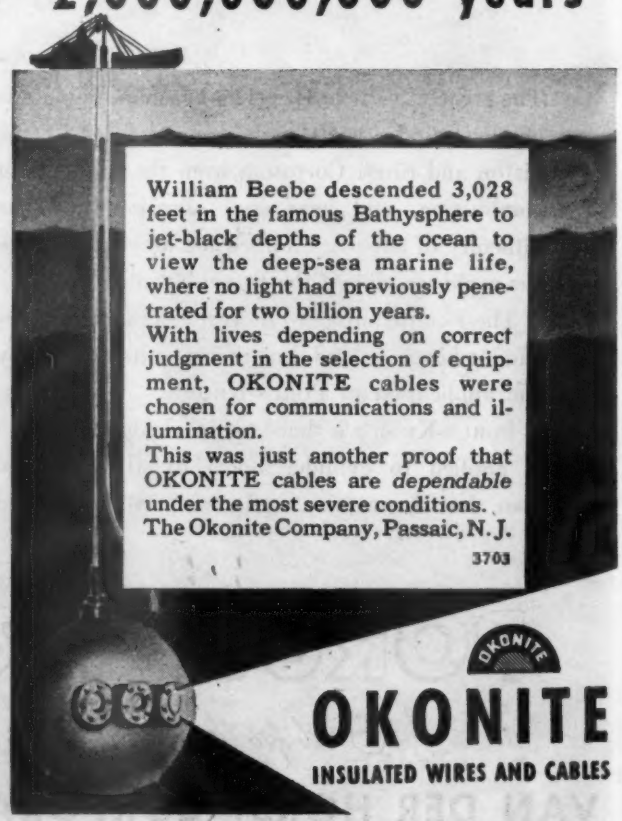

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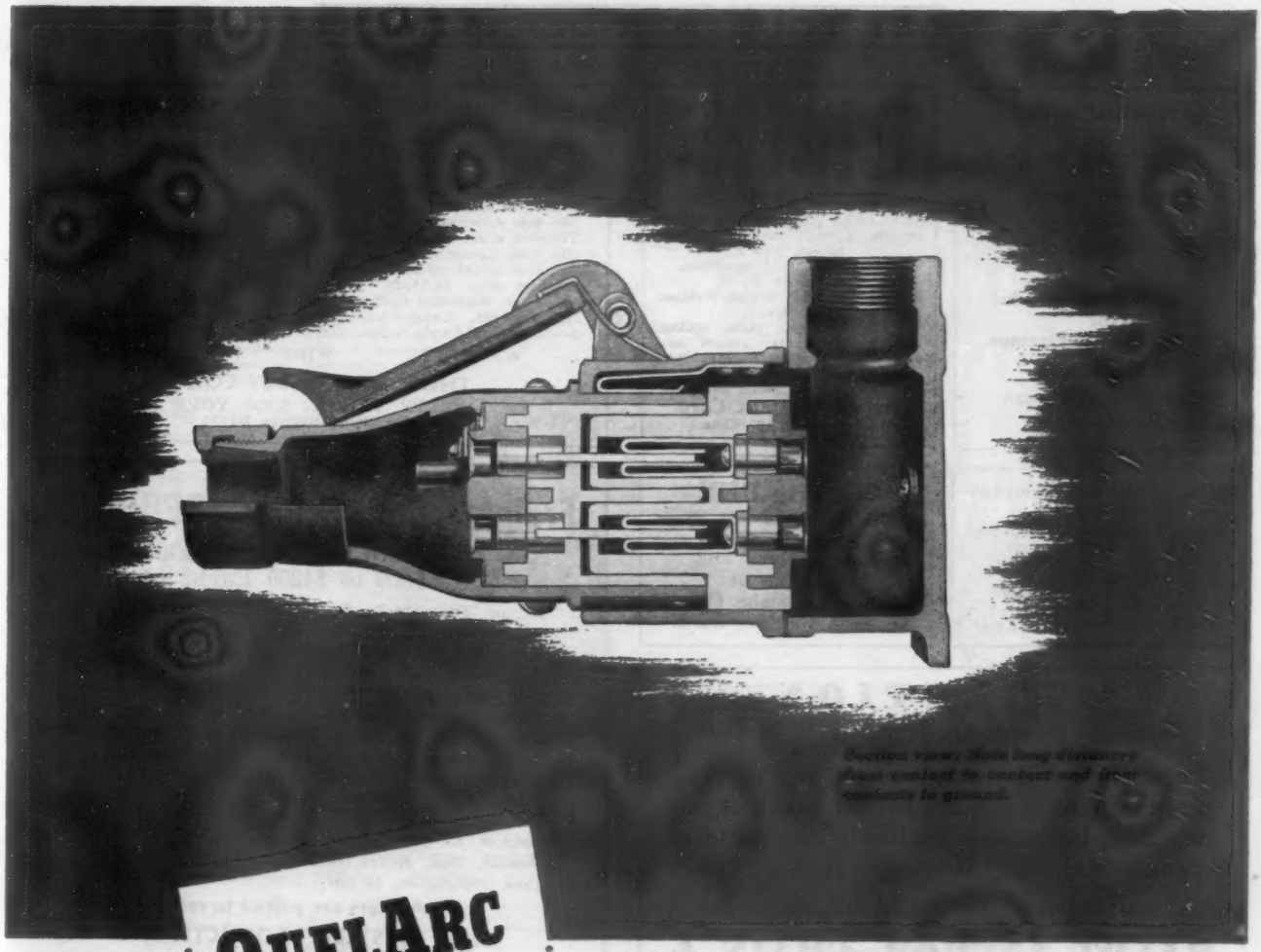

Section views. Note long distances from contact to contact and from contacts to ground.

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Pyle-National plugs and receptacles are built to stand up in railroad service, delivering dependable service with minimum maintenance. The exclusive QuelArc construction provides exceptional protection to contacts, for safe use as current rupturing devices. In the section view, note the complete enclosure of all contacts in insulating chambers which form an arc-trapping space. Note also the long distances from contact to contact and from contacts to ground. Contacts are individually renewable. Full ground protection is provided.

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Now Only Half of Recent Peak Prices—$500 to $4250 Each!

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16, Refrigerator, 40-Ft., 40-Ton
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1, Dump, Koppel Drop Door, 20-Yd., 40-Ton; Steel Door
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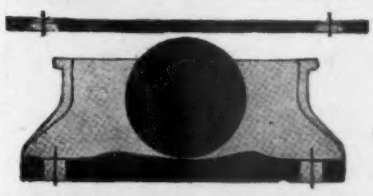

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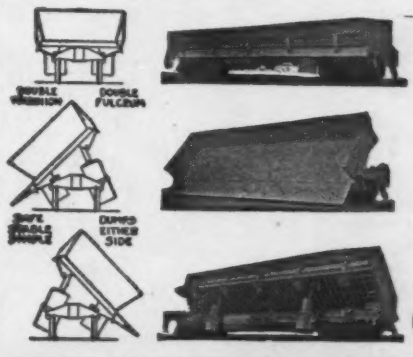

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